

**BUILDING  
OR BUYING  
A HOUSE**

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2006







# **BUILDING OR BUYING A HOUSE**

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**A Guide to Wise Investment**



# **BUILDING OR BUYING A HOUSE**

## **A GUIDE TO WISE INVESTMENT**

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To our wives, who have helped us to build  
and make our homes and who by their de-  
votion and confidence encouraged us in our  
efforts, we dedicate this book.



## ACKNOWLEDGMENTS

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THE AUTHORS.





# FOREWORD

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If you intend to buy a home—

If you intend to build a home for your own occupancy—

If you intend to buy a lot to hold until you are ready to build—

If, in short, you belong to that great class of Americans who look forward to “owning a home someday,” this book is for you.

We are assuming that you expect to live in this home yourself. Hence you have a peculiar interest in eliminating hazards, inconveniences, and sources of future trouble. Because it will be your home, it should be adapted to your own living habits. It should be right for you and your family.

We are assuming that you have no money to waste, that you hope to make a sound investment.

All of us who collaborated in writing the book have devoted our whole professional lives to the practice and teaching of building design and construction. We all own our homes. We sincerely hope that others may profit from our experience.

In the end, of course, the decisions must be your own. It will be your knowledge, your business judgment, that determines success or failure in the undertaking. What we can do here is give you facts, remind you of things to look for, and possibly sharpen your critical sense. We are offering a multitude of practical suggestions—and warnings too—about all sorts of problems related to home ownership: financing, selecting a site, planning, judging the construction, negotiating agreements and contracts. All are important.

We have tried to present a concise, nontechnical, usable guide for ordinary persons whose experience in such matters is limited.

We hope the book will help.

STATE COLLEGE

B. K. J.  
C. L. H.  
R. M. G.  
L. A. R.  
E. L. W.



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# **BUILDING OR BUYING A HOUSE**

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# FINANCING

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MORAL RISK—WHAT IS A MORTGAGE?—THE STRAIGHT MORTGAGE—THE AMORTIZED MORTGAGE—METHODS OF PAYMENT—TOTAL COST OF A MORTGAGE—F.H.A. INSURED MORTGAGES—HOW MUCH CAN YOU AFFORD?—DISCHARGE OF MORTGAGE

**B**UILDING or buying a home represents one of the largest financial transactions of a lifetime for the average family and is usually the happy conclusion of many eager years of planning and conscientious saving.

The decision to own a home is a decision to exchange one form of wealth for another form of wealth; that is to say, it is the intention to exchange money for property. This is a commonplace business venture, but like all business it includes an element of risk.

During the normal course of a year your daily requirements cause you to purchase numerous articles, some of little value, others more expensive. There is always the possibility of not getting your money's worth. The same can be said of the purchase of a home. While everyone at some time or other has paid more for an article than it subsequently proved to be worth, he seldom worries much about the loss. Instead he charges it off to experience and hopes to avoid the same mistake a second time.

Buying a house is generally different, however. Most families own no more than a few homes in a lifetime; many buy or build a home only once. If an error in judgment is made when a home is purchased, it cannot be charged so simply to experience. There may be no next time. The consequence of bad judgment could be a serious, even a critical financial loss.

Suppose you prefer to invest your savings in stocks and bonds rather than in a home. Since the value of securities is constantly changing, there is here also an element of risk. They may decrease in value—may even become worthless. However, if the securities do lose their value, the maximum amount you can lose is what you paid for them, assuming that you paid for them in full. But you cannot say the same for the money that you have invested in a home.

When you cannot pay for your home in full, and few can, home ownership represents the investment not only of your present savings, but also of what you expect to save over a period of years. The risk of future as well as present savings should serve to emphasize the importance of approaching home ownership without haste, with caution, and with sufficient knowledge of your undertaking.

Home ownership can be happy and profitable or it may be disheartening and a financial burden. The experience of each buyer will depend upon the honest recognition of his capacity to earn and his ability to save, both of which will determine his ability to pay. It is better to be conservative rather than optimistic

about your ability to pay. Advice from your banker may help you to decide what you can afford, but in the last analysis your decision is a personal one which demands conservative business judgment of your own.

In spite of the recognition that a house, like its furniture, is consumed by living in it, home ownership is commonly viewed as an investment. A house does wear out, and after ten or fifteen years should not be expected to sell for what you have put into it. Because of increased prices of building materials and the wages of labor, many homes have been built, lived in, and sold for more than their original cost. Likewise, many already built have been bought and sold at a profit. Nevertheless, this will not always be possible. Many indications today suggest that it may not be generally true in the future. Some of the money you put into a home will remain there as savings, but some of it will pay only for the use which you enjoy.

Only the few fortunate persons who can buy or build for cash can achieve home ownership without the advice and help of their bank or other lending agency. Too often those who must turn to a lending agency for financial guidance and help do so in a spirit of humility and fear, feeling that to ask for the loan of money is only a more dignified form of begging. Nothing could be further from the truth and the banker or building and loan company agent will be the first to admit it. Lending agencies are as anxious to lend you money as you are to get it. If they are doing you a favor to give it to you, you too are doing them a favor to accept it. A lending agency is in business: it sells you a service on which it takes a profit just as a store sells you an article and takes a profit.

### MORAL RISK

However, there is one aspect of dealing with a lending agency that is not considered when dealing in cash with a store. This aspect of a financial transaction is referred to as "moral risk" and may be the most important factor in determining whether the lending agency will or will not lend you money. To understand moral risk it is necessary to recognize, first, that lending agencies are distributing other people's money for which they are held accountable and, secondly, that the amount of money you have may be no indication whatsoever of your ability or willingness to meet your financial obligations. You must have income and earning power which are the result of your ability to do something constructive, whatever that may be. Even then a lending agency will not be interested in doing business with you unless you have the intention and willingness to repay the loan.

Let us look at the case of John and Mary who are both under thirty, have no children, and as the leaders in the town party crowd are liked by everyone. John is employed as a civil engineer at a salary of \$400 a month. They have always wanted a home. Their Uncle Fred offers to lend them \$4,000 as a nest egg on John's personal note with no security. Happily they go to the bank to negotiate a loan which will permit them to buy a \$10,000 home, just what they have always wanted. On the surface they appear to be a good business risk. It comes as a shock to learn that the bank refuses to lend them money. What, then, does the banker know that may not be apparent to others? First, he knows that John and Mary will be investing none of their own money. He also knows that they live



in a pretentious manner and to the limit of their income. As evidence of this, he knows that they have no savings account into which regular deposits are made, but carry all of their money in a checking account. Moreover, John had to borrow to meet the income-tax payment which everyone knew would be due on March 15. They both feel that it is foolish for young people to carry life insurance and have said so in public.

In the estimation of the banker John and Mary are a poor moral risk and probably will be for some time, since people do not easily change their habits or mode of living. As much as he may like John and Mary and enjoy their company, the banker cannot risk money which belongs to others who place confidence and trust in his business judgment. In considering moral risk, the banker knows that you can't pay debts with good intentions. Consequently, while he is reaching a decision about your request for a loan, you may be certain that he will appraise you as well as your property.

The lending agency should be taken into your confidence at the very beginning of your plan to build a home, not after you have bought property, employed an architect, and are almost ready to let the contract. Whether you build or buy, early conference with the lending agency cannot be overemphasized. For one thing, you must be certain that the lending agency is willing to lend you money on the property you have selected. When you plan to build, it is not enough to own just any piece of property. It must usually be what is called an "improved site": on an ordained street with water, electricity, and telephone, either adjacent or available.

The lending agency will look with favor on businesslike methods; so it is advisable to apply for a loan in a businesslike way. The help that the lending agency can give you depends entirely on the completeness and accuracy of their knowledge of your financial condition. In this respect the lending agency is comparable to your physician, whose accurate diagnosis is dependent on information which you give him. Similarly, the lending agency will diagnose your financial condition. Just as you trust your physician with confidential information, so should you trust the lending agency. Professional ethics will not permit the lending agency to divulge your financial secrets.

It is businesslike to prepare in written form all pertinent information about your financial situation. Banks will usually require you to file this information on a form of their own. Generally, this information should include:

1. A list of the amounts that others owe you, together with the dates on which this money is or was due.
2. A list of stocks and bonds that you own with the number of shares of each, the par value of the bonds, and the market values of the stocks.
3. A list of real estate that you own, including the cost to you or a fair estimate of present value, together with a description of existing mortgages or other encumbrances. The lending agency will prefer to have all of the taxes and assessments paid.
4. The cash value of your life insurance. Your insurance company will gladly furnish this information.

5. Any accounts that you must pay and the date or dates on which payments are due.
6. Notes payable to banks or individuals, the kind of note, and conditions of payment.
7. Other assets or liabilities if they exist.
8. Data on your annual income if you are a wage earner, or a summary of your business status if you are in a business of your own.

### WHAT IS A MORTGAGE?

The most common way to finance the purchase of a home is by giving a **mortgage**. This is a promise to pay a debt, giving land and house as security for the debt. If the owner fails to make payment on or before a certain date, his right to redeem the property is lost and ownership passes to the person or agency that made the loan and took the mortgage in exchange. The court will then require that the property be put up for public sale so that the first owner may receive any surplus value over and above the amount of the mortgage. This legal action is called an **action of foreclosure and sale**.

Since a mortgage may run for as many as twenty-five years, the time element makes some forethought necessary. For instance, it would be unwise for a wage earner fifty-three years old to enter into a twenty-year mortgage. His capacity to pay may not continue for another twenty years, and losing the capacity to meet payments may result in foreclosure and loss of the property. Possible future commitments such as expected increase in the size of your family, or children entering college, may affect the length of time over which you can pay without undue hardship. Likewise, the possible necessity of supporting aged parents or other members of your family may affect your future capacity to meet mortgage payments. Although future obligations cannot always be clearly foreseen and will vary with each family, you should estimate them as accurately as possible and consider them as a vital part of your present financial situation.

Before proceeding to a description of the types of mortgages and the methods of making payments, it may be well to review the terms which must appear in the discussion.

The **principal** of a mortgage is the amount of the mortgage. If the lending agency makes a loan of \$1,000, this amount is referred to as the principal.

**Interest** is the sum you pay for the use of money which the lending agency has lent to you. The rate of interest is expressed as a percentage such as 5 per cent, which means that the amount you pay each year for the use of money will be 5 per cent of the principal of the loan. For example, let us suppose that you borrow \$1,000 (the principal) at 5 per cent interest for a period of one year. At the end of the year you will repay the amount of the principal, \$1,000, plus 5 per cent, or \$50, as interest. The lending agency may require you to pay interest more often than once a year, in which case the \$50 may be divided into quarterly payments of \$12.50 each or semiannual payments of \$25 each.

Not all lending agencies charge the same rate of interest and it is not uncommon for those in the same community to charge different rates of interest. Consequently, it is advisable to shop for money just as you would for any other

standard article. Although a difference of  $\frac{1}{4}$  or  $\frac{1}{2}$  per cent in interest rates may appear insignificant for small loans over a short period of time, the difference in total cost over a long period of years can be considerable. The difference between 5 per cent and  $5\frac{1}{4}$  per cent interest on a \$5,000 straight mortgage for a period of five years will amount to \$62.50.

To **amortize** a mortgage means to reduce the amount of the principal by repaying part of it. Since the interest that you pay is a percentage of the value of the principal, as you reduce the principal the amount of the interest payment is correspondingly reduced.

For example, let us suppose that you borrow \$1,000 at 5 per cent for a period of one year and wish to amortize the mortgage in quarterly (every three months) payments. If the mortgage ran from January 1 to January 1, the following year, on April 1 you would repay or amortize \$250 together with an interest payment of 5 per cent of \$1,000, or \$12.50, for the three months of January, February, and March. The principal of the mortgage would thus be reduced to \$750.

On July 1 you would again amortize \$250 and would also make an interest payment. This time the interest would not be on \$1,000, but only on the actual amount of the principal, which for the three months of April, May, and June would be \$750. Consequently, the interest payment would be \$9.38.

Similarly, payments of both principal and interest would be made on October 1 and on January 1, of the following year. Thus the principal would be amortized in full over a period of one year.

By **appraised value** the lending agency means the value which its appraisal committee will assign to your property. This committee is usually made up of men who have had years of experience in judging the value of land and buildings. The appraised value of your property may not be what you paid for it. It may be more or it may be less.

Mortgages are mainly of two types, known as a **straight mortgage** and an **amortized mortgage**. These can be defined, but they cannot be compared except as they meet the needs of one individual. While the characteristics of one type may be a perfect solution to the financial problem of one person, the same mortgage may be inadvisable for another person. The type of mortgage that you select will be the one which best fits your own financial situation.

### THE STRAIGHT MORTGAGE

A straight mortgage is one in which the borrower promises to pay the full amount of the mortgage on a certain date with no obligation to make any payment on the principal before that date. Interest is paid at regular intervals agreeable to both the borrower and the lending agency.

A national bank or other lending agency under Federal control cannot accept a straight mortgage for an amount greater than 50 per cent of the appraised value of the property. Furthermore, the life of the mortgage cannot exceed a period of five years.

A state bank or other lending agency under state control can usually lend a higher percentage for a longer period of time, but since practice differs throughout the country, it is impossible to set down a definite procedure common to all.

Although the borrower promises to pay the full amount of the mortgage on a certain date, it is customary practice for the lending agency to renew or extend the mortgage for a period of years if requested to do so when the mortgage expires. The lending agency may renew it for the full amount, but more often will request a reduction of the principal by a partial payment.

When considering the renewal of a mortgage, it is important to recognize two factors. First, the lending agency is under no obligation to renew your mortgage at the same rate of interest. Secondly, the lending agency is not obligated to renew it at all. Business conditions may force the agency to demand payment. If this happens and you do not have the money, and if the real estate market is so poor that no other lending agency will make a loan on your property, then ownership of your home is in jeopardy.

It is good practice when giving a straight mortgage to reserve the right to make a payment on the principal at any interest-bearing period, which is usually every six months. You may not wish to use this privilege, but it is in your best interest to reserve the right nevertheless. To do so gives you greater financial flexibility to meet any unforeseen problems.

In smaller communities where everyone knows and is known to those working in the bank, it is not uncommon for the bank officer in charge of mortgages to tell you not to worry about the due date of your straight mortgage—"Just let it run and continue to pay the interest." Although a statement of this kind may be made in all honesty and with the best of intentions, do not heed any such advice. To renew or extend your mortgage by verbal consent without naming a due date makes it payable at any time—tomorrow, in fact, if the lending agency chooses to call it in. You may say, "But they wouldn't do that," and many others said the same thing the day before the stock market crash in 1929. The lending agencies were then forced to demand payment to protect themselves, and thousands of families lost their homes.

## THE AMORTIZED MORTGAGE

An amortized mortgage is one wherein the value of the principal is reduced by regular payments, usually monthly, quarterly, or semiannually. In addition to the payments repaying the principal, regular interest payments are also made. With this mortgage, as with a straight mortgage, it is advisable to reserve the right to make payments larger than those agreed upon. This is usually permitted at specified periods but is often limited to sums in round numbers, such as \$100.

An amortized mortgage may be taken by either a bank or a building and loan company and, depending upon the borrower's problem, each has advantages.

When accepting an amortized mortgage, a national bank is restricted as follows:

1. The amount of the mortgage cannot exceed 60 per cent of the appraised value of the property.
2. The mortgage cannot run longer than ten years.
3. The principal must be amortized at a rate not less than 4 per cent per year or a total of 40 per cent in ten years.

Thus, for example, if you wished to give a mortgage on your property valued at \$10,000, a national bank could give you a maximum of \$6,000 for a period of ten years. During this period you would pay the interest plus not less than 4 per cent (in this case \$240) a year on the principal. By amortizing 4 per cent each year, at the end of ten years you would have reduced the principal by \$2,400 and would then owe \$3,600. You might then renew the mortgage for the remaining \$3,600 for another ten-year period, provided of course that the lending agency is willing.

An amortized mortgage is preferred by most people because its terms are definite and fixed in advance. So long as you make the payments when they are due, you are in no danger of losing your property. However, if the mortgage has not been amortized in full over the ten-year period, there is the same element of risk at the time of renewal that exists with a straight mortgage.

You may wish to finance your home by giving a mortgage to a building and loan company. The essential difference between this lending agency and a national bank is that while a national bank is restricted to loaning not more than 60 per cent of the appraised value of the property, the building and loan company commonly accepts mortgages up to 70 per cent and in exceptional instances may even go to 80 per cent of the appraised value. Needless to say, the building and loan company when granting larger loans must exercise more care in selecting those to whom it will lend money.

When a building and loan company takes your mortgage, it generally will be written for a term of approximately twelve years and will provide for full payment of the principal over the life of the mortgage. If you meet all payments when due, you will then own your home when the final payment is made. You thus eliminate the risk connected with renewal and all terms of the mortgage are definitely known at the very beginning.

Regardless of whether you give an amortized mortgage to a bank or to a building and loan company, there are two different ways in which payments may be made. The details of the plans offered by a lending agency may differ slightly, but in essence you may consider the figures which follow as approximately correct. Since practices differ, it is necessary to say that they are used for illustration only.

### METHODS OF PAYMENT

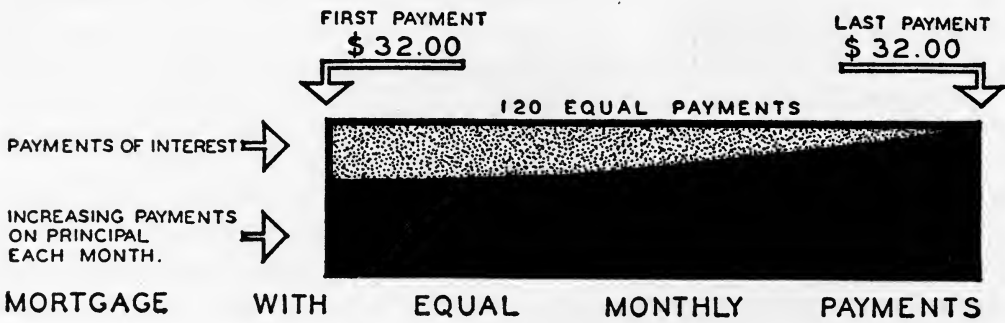
An amortized mortgage may be paid either in fixed monthly payments or in decreasing monthly payments. For illustration suppose you have arranged an amortized mortgage for \$3,000 to run ten years and to be amortized in full over the ten-year period with interest at 5 per cent. Because the term of ten years has been chosen for the examples that follow, it should not be assumed that ten years is the usual length of a mortgage term. Some are written for only a few years and many for as long as twenty years.

The fixed monthly payment plan requires the same amount to be paid each month for a period of ten years or 120 months. For the mortgage described above, the monthly payments would be \$32. In the first month \$12.50 of the payment would be for interest and \$19.50 for reduction of principal. As monthly payments are made, the principal is reduced. Thus for each succeeding month the part

# FINANCING

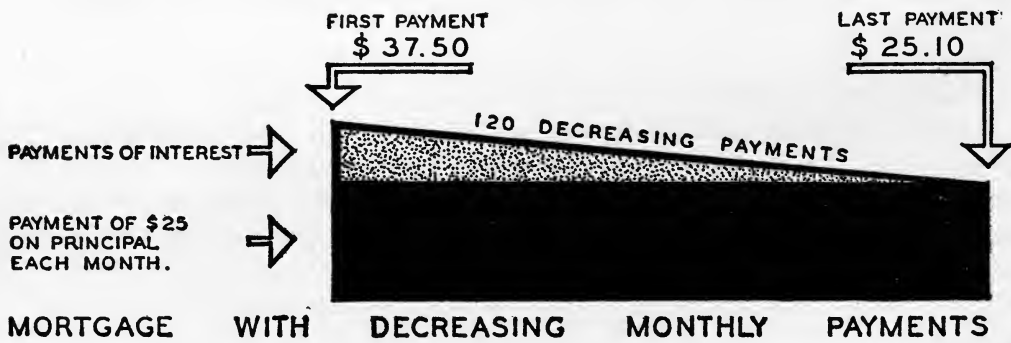
applied to interest decreases while the payments on principal increase. The 120th and final payment, though still \$32, would include only 13 cents for interest and \$31.87 as payment on principal.

Following is a diagram of this plan of payment:



The decreasing monthly payment plan requires the same payment on the principal each month together with an interest payment which reduces as the principal reduces. If you used this method to pay the same \$3,000 mortgage we have used for illustration above, you would repay the principal in 120 equal payments of \$25 each month. Thus your first payment would be \$25 plus \$12.50 interest, a total of \$37.50. The last or 120th payment would be \$25 plus 10 cents interest, a total of \$25.10.

Following is a diagram of this plan of payment:



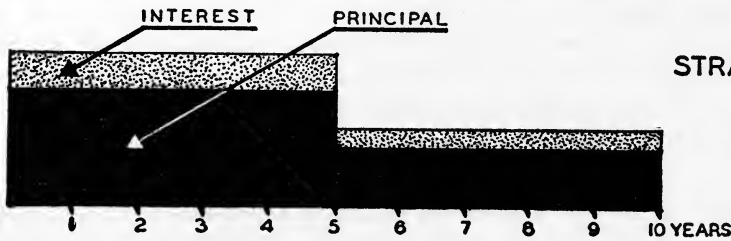
## TOTAL COST OF A MORTGAGE

It will be apparent from the above diagrams and a few minutes of calculation that all mortgages do not cost the same amount, although the value of the mortgages when written may be identical and the interest rate and number of years the same.

The diagrams on page 11 represent the total cost of the three most common methods of mortgage payment. The value of each is \$3,000, the interest rate 5 per cent, and the term ten years. In order to have comparable figures all three are amortized in full over the ten-year period. You will remember that the straight mortgage may have to be renewed for the second period of five years; it is assumed here that the principal is reduced to half at that time, although the bank may

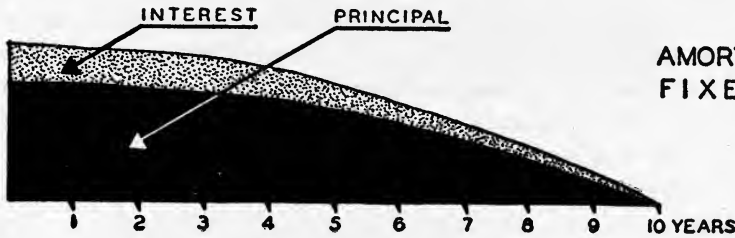


not require it. If it were not reduced that much, the total cost would be greater. Again the term of ten years is used only as an example.

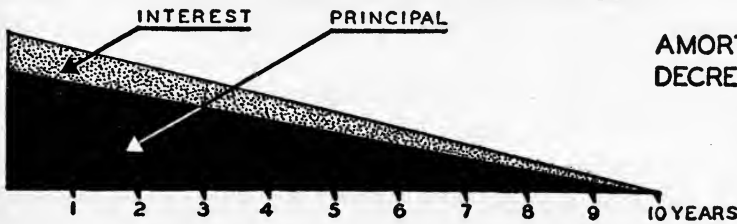


## STRAIGHT MORTGAGE

PRINCIPAL	\$ 3000.00
INTEREST	\$ 1125.00
<b>TOTAL</b>	<b>\$ 4125.00</b>

AMORTIZED MORTGAGE  
FIXED PAYMENTS

PRINCIPAL	\$ 3000.00
INTEREST	\$ 841.00
<b>TOTAL</b>	<b>\$ 3841.00</b>

AMORTIZED MORTGAGE  
DECREASING PAYMENTS

PRINCIPAL	\$ 3000.00
INTEREST	\$ 750.00
<b>TOTAL</b>	<b>\$ 3750.00</b>

COMPARATIVE TOTAL COST OF THE MOST COMMON TYPES OF MORTGAGES  
EXAMPLE: \$3000 PRINCIPAL — 5% INTEREST — AMORTIZED IN 10 YEARS

After examining these diagrams, your first question may be, "But why are there three different kinds of mortgages? Doesn't everyone prefer the one that costs the least?" No, not everyone prefers the one that costs the least. It may not fit one's own personal financial problem. Under certain circumstances each type of mortgage has desirable characteristics which may outweigh the extra cost.

The **amortized mortgage with decreasing monthly payments** is not written by building and loan companies. Consequently, if you must borrow more than 60 per cent of the appraised value of your prospective home, you must eliminate this type.

Although this is the cheapest way to finance the cost of your home, many people do not prefer it. For younger people there is the obvious fact that the largest payment must be made at the beginning, when because of low income they are least able to pay. In later years when their earning power has increased and they are better able to pay more, the payments are smallest. Some owners consider that the smaller payments in the beginning are worth the extra cost.

If you select this type of mortgage, you will probably give it to a bank. If it is a national bank, the life of the mortgage is limited to a maximum of ten years. If the bank is state controlled, the term of years may be more generous, but in either case you should consider the renewal risk if the mortgage cannot be paid

in full during the time allowed. Although it is true that during normal times the renewal risk is small, nevertheless many people do not wish to gamble on the condition of the real estate market ten years or more ahead.

You may have to pay a renewal charge at the end of the ten-year period. It is not customary for banks in small communities to make a charge for renewal, but this is common practice in large metropolitan banks and mortgage companies. You cannot be certain that the interest rate will not be increased at the time of renewal.

When the **amortized mortgage with fixed monthly payments** is taken by a building and loan company, you may borrow 70 per cent of the appraised value and may go even slightly higher. Furthermore, a building and loan company will usually agree to any number of years up to twelve at first writing. Since the building and loan companies encourage amortization in full, the renewal risk is eliminated and you know at the very beginning the exact and definite payments you are obligated to meet until your home is paid for. Some people feel that their peace of mind is worth the extra cost.

This type of mortgage may also be written by a bank, but again, if it is a national bank, the loan is restricted to a term of ten years with possible renewal. The practices of state banks differ so much no general statement can be made about them.

Since payments are equal for the entire life of this mortgage, they are lower during the first years than those on a mortgage with decreased monthly payments. This characteristic appeals to those whose present earning power is low but may be expected to increase. Equal payments every month also appeal to people who receive a salary.

During the first few years this type of mortgage does not pay off much of the principal. Consequently, if you must sell your home after only a few years, you will find that you still owe more on the mortgage than you would if you had selected the type with decreasing monthly payments.

The **straight mortgage** is apparently the most expensive. Your building and loan company will probably not handle it. A national bank is restricted to accepting it for a period of not longer than five years subject to renewal, and the practices of state banks vary.

The straight mortgage is seldom used today for home finance because of the large down payment required. Furthermore, since payment is made in a lump sum when the term expires, it does not usually appeal to those who earn a salary and consequently prefer to make small payments at regular intervals.

In a few instances the straight mortgage may be desirable for those who are able to make the larger down payment but wish to retain the use of future savings. If you select it for this reason, you will pay only the small interest payments during the life of the mortgage, but it is well to be certain that you can meet the final payment when it is due.

### F.H.A. INSURED MORTGAGES

By providing for the insurance of mortgages the National Housing Act made home ownership possible for many who could make only a small down



payment in cash and small monthly payments for interest and amortization. Although this act covers several distinct fields with numerous administrative rules and regulations, the essential characteristics dealing with new home construction can be easily summarized.

An F.H.A. insured mortgage can be accepted by any approved financial institution. The home builder who gives a mortgage under the F.H.A. insured mortgage plan assumes the payment of a small mortgage insurance premium ( $\frac{1}{4}$  or  $\frac{1}{2}$  per cent) which guarantees repayment to the lending agency of the full amount of the loan if and when the homeowner might be unable to meet the payments.

F.H.A. loans for new home construction are divided into three classes, each of which is governed by certain provisions:

1. **Small loans** are those which do not exceed \$5,400 and where at least 10 per cent of the appraised value has been paid in cash or its equivalent. These cases are eligible for loans:
  - a. Up to 90 per cent of the value.
  - b. Up to a twenty-five-year amortization period.
  - c. At an insurance premium rate of  $\frac{1}{4}$  per cent per year.
2. **Medium loans** are those which exceed \$5,400 but do not exceed \$8,600. These are eligible for loans:
  - a. Up to 90 per cent of the first \$6,000 of value plus 80 per cent of the remainder.
  - b. Up to a twenty-year amortization period.
  - c. At an insurance premium rate of  $\frac{1}{2}$  per cent per year.
3. **Large loans** are those which exceed \$8,600 but do not exceed \$16,000. These are eligible for loans:
  - a. Up to 80 per cent of the value.
  - b. Up to a twenty-year amortization period.
  - c. At an insurance premium rate of  $\frac{1}{2}$  per cent per year.

F.H.A. loans for the purchase of an existing house are limited to 80 per cent of the appraised value and may not run for longer than twenty years. The insurance premium rate is the same as that for loans on new construction.

The borrower's ability to pay or any of various other factors may necessitate lower ratios than those mentioned above. The figures indicate the maximum which a lending agency may grant, but an agency is not required to lend the maximum amount to anyone. In spite of mortgage insurance, the moral risk is still considered important.

If you use an F.H.A. insured mortgage, you will be required to pay a small appraisal fee when filing application. You will also be required to include in your monthly payments not only the usual payments of interest and amortization, but also the mortgage insurance premium and an amount to cover the expense of fire and other hazard insurance, taxes, and special assessments. Except for the mortgage insurance, you would pay all of the others anyway; so they do not represent added cost but rather planned saving to pay known expenses.

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In order to qualify for an F.H.A. insured mortgage, not only the owner, but the building, its plan, its materials, and the methods of construction are appraised. Your architect or banker will have a copy of the official circular on minimum requirements of property standards which describe the minimum requirements in detail. The owner need not be concerned about these requirements because they specify only standards which protect his interests and his investment. The average house will usually be above the minimum standards.

Other restrictions regarding the eligibility of mortgagors and properties are similar to the good-business practice of the average bank or other lending agency.

Interest rates at this writing may not be in excess of  $4\frac{1}{2}$  per cent per year, to which is added the  $\frac{1}{4}$  or  $\frac{1}{2}$  per cent to pay the mortgage insurance premium. Payments on an F.H.A. mortgage are made in equal monthly installments for the number of years the mortgage is to run.

## HOW MUCH CAN YOU AFFORD?

Finally the question that must eventually be asked is, "How much can I afford to spend?" This question is often answered haphazardly by rule of thumb, to the effect that you can afford to spend from two to two and a half times your annual income. That is, if you earn \$3,000 per year, you may spend \$7,500 for your home and expect to pay for it without undue hardship. Beware of this rule of thumb. It is a generality and, since it is only an average figure, may not be true for you.

At this point it is of vital importance to remind you to stick to the facts of your own personal financial situation. The success of your venture is dependent upon **your** earning power and **your** saving power and yours alone. Nobody else can decide what you can do and only you can analyze your own financial problems with a high degree of accuracy. The lending agency will help you, but you must make the final decisions.

Either or both of two factors will control the amount you can spend for a home. The first is the amount of money you have. The second is the amount you can afford to pay each month, every three months, or semiannually over a period of time.

The amount of your down payment will be governed by the amount of money you have. This money will usually be in cash, life insurance, stocks, or bonds.

Your insurance company will gladly let you know the cash surrender value of your policies. If you assign your policy to the bank, it is common practice for the bank to lend you the full amount of the cash surrender value less the amount of one premium. That is to say, if the cash surrender value is \$1,522.40 and the semiannual premium \$162, the bank will lend you the difference, or \$1,360.40.

The amount of a loan on insurance is reduced by the value of one premium payment. Thus if you do not pay a premium, the bank may do so and keep the policy in force for the period needed to take legal action. If legal action is necessary and the policy is settled, the bank would be paid in full, the value of the loan plus the amount of the premium it paid to keep the policy in force.

The value of your insurance is not affected by assigning it to the bank. If

this is done, it means only that in the event of death or maturity the bank has first claim to the amount of your loan. You retain the right to receive any disability income and to designate or change the beneficiary. You may also elect optional modes of settlement while the policy is assigned. The bank is under no obligation to pay the premiums, and should you default in any way or fail to pay the premiums, the bank reserves the right to surrender the policy for its cash value, usually after giving you twenty days' written notice of its intentions.

You may also borrow on the cash value of your insurance directly from the insurance company. A comparison of interest charges will quickly determine which source of a loan is to your advantage. How and when you repay what you borrow are matters to be arranged with the lending agency.

The bank will lend you money on your stocks and bonds, but you may be certain that the amount will not exceed 75 per cent of their market value and will usually be less. When borrowing on stocks and bonds, it is customary for the bank to require you to sign what is virtually a demand note for the value of the loan. A demand note is one which you may be asked to pay at any time and which you will certainly be asked to pay if the market value of your stock goes below the appraised value at the time the loan was made. When this happens, the bank may ask you for more stock or other securities or may ask you to sell the stock and repay the loan.

After you determine the cash value of your assets, it is well to recognize the wisdom of putting some of your cash aside for contingencies such as unemployment, sickness, or accident. It is considered good business to let this contingency sum equal twice your monthly salary or income.

If you do not need to consider your capacity to make monthly payments on a mortgage, the amount of cash you can put into a down payment will, together with the lending agency you select, determine the amount of mortgage the lending agency will accept. The lending agency will, of course, consider the moral risk. If you already own your land, its appraised value can be considered as part or all of your cash down payment.

If you wish a straight mortgage from a national bank, its value is limited to 50 per cent of the appraised value of the property; so your cash down payment must equal 50 per cent.

If you wish an amortized mortgage from a national bank, its value is limited to 60 per cent of the appraised value of the property; so your cash down payment must equal 40 per cent.

If you wish a straight mortgage from a state bank or trust company, the value of the mortgage will be higher than that accepted by a national bank or other agency governed by Federal laws. In some states the percentage is limited to 66 $\frac{2}{3}$  per cent on a straight mortgage for a term of ten years while an amortized mortgage may extend to 16 years. In the latter instance, however, the entire mortgage must be amortized over the period agreed upon.

If you wish an amortized mortgage from a building and loan company, its value may be from 70 to 80 per cent of the appraised value of the property; so your cash down payment must equal 20 to 30 per cent.

If you wish an F.H.A. insured amortized mortgage, its value is limited to

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90 per cent of the appraised value (under \$5,400) of the property; so your cash down payment must equal 10 per cent.

If another person wishes to assume your mortgage, the question of the amount of the mortgage, the time it is to run, the method of payment, and the rate of interest are matters to be decided by the contracting parties. The law will presume that each party is capable of determining values and will not interfere in that respect.

If you need not be concerned about the amount of your monthly payments, the following tables will quickly give the approximate value of mortgages in relation to the cash down payment. The column at the left indicates the amount of a down payment. Opposite the amount which comes closest to the amount of your down payment you will find, reading across the page, the approximate value of mortgages which the lending agencies may accept. The lending agency, considering the moral risk, may not be willing to assume the amounts shown here.

## Approximate Value of Mortgage in Relation to Cash Down Payment

<i>Cash Payment</i>	<i>Straight Mortgage</i>	<i>Amortized National Bank</i>	<i>Amortized Building and Loan</i>	<i>Amortized Insured F.H.A.</i>
\$ 300	\$ 300	\$ 450	\$ 900	\$ 2,700
500	500	750	1,500	4,500
750	750	1,125	2,250	6,000
1,000	1,000	1,500	3,000	7,000
1,250	1,250	1,875	3,750	8,000
1,500	1,500	2,250	4,500	8,600
1,750	1,750	2,625	5,250	8,600
2,000	2,000	3,000	6,000	8,600
2,500	2,500	3,750	7,500	10,000
3,000	3,000	4,500	9,000	12,000
3,500	3,500	5,250	10,500	14,000
4,000	4,000	6,000	12,000	16,000

If the amount of money you can afford to pay each month must determine the amount of the mortgage you can assume, the table on page 17 will help you to reach an approximate figure. This figure is based on a mortgage amortized in full with equal monthly payments at an interest rate of 5 per cent. For an accurate figure you should see your banker or building and loan agent. The monthly payments do not include the mortgage insurance and taxes which are added to F.H.A. mortgages. This table should be used only as a guide.

When you have decided how much your down payment can be and how much you can afford to pay on the mortgage, you can then determine with a good degree of accuracy how much you can spend for the land and building. Many people think these two amounts are one and the same, but they are not. The actual cost of land and building including such improvements as walks, driveways, retaining walls, and grading represents approximately 94 per cent of the total cost. This is discussed in detail in the later chapter on cost analysis, but at this point it is well to recognize that there are many incidental expenses

### Approximate Amount of Mortgage Based on Equal Monthly Payments, Interest at 5 Per Cent

Monthly Payment	AMORTIZATION PERIOD						
	5 Years	8 Years	10 Years	12 Years	15 Years	17 Years	20 Years
\$20	\$1,100	\$1,600	\$1,900	\$2,200	\$2,600	\$2,800	\$3,100
25	1,300	2,000	2,300	2,700	3,100	3,400	3,800
30	1,600	2,400	2,800	3,200	3,800	4,100	4,500
35	1,800	2,700	3,300	3,700	4,400	4,800	5,300
40	2,100	3,100	3,700	4,300	5,000	5,400	6,000
45	2,300	3,500	4,200	4,800	5,600	6,100	6,800
50	2,600	3,900	4,700	5,400	6,300	6,800	7,500
55	2,900	4,300	5,100	5,900	6,900	7,500	8,300
60	3,100	4,700	5,600	6,400	7,500	8,200	9,000
65	3,400	5,100	6,100	7,000	8,200	8,900	9,800
70	3,700	5,500	6,500	7,500	8,800	9,600	10,600
80	4,200	6,300	7,500	8,600	10,100	10,900	12,100
90	4,700	7,100	8,400	9,700	11,300	12,300	13,600
100	5,200	7,800	9,400	10,800	12,600	13,700	15,100

which must be paid whether you build or buy a home. If you build your home, you must provide in your budget for the cost of grass, shrubbery and probably some trees, legal fees, surveyor's fees, the cost of a title search, recording fees, and financing charges or interest payments during the period of construction. These will represent approximately 6 per cent of your total investment—on a \$10,000 investment approximately \$600. Thus if you intend to invest \$10,000, only \$9,400 should be budgeted for the actual property.

When buying a home, much will depend on whether it is an old house or a new house built for sale by a developer. If it is new, you may have to provide for all the incidental expenses mentioned above except the interest payments during construction and possibly a surveyor's fee. You may have to pay for walks, driveways, retaining walls, fences, and clothes poles if these have not yet been added.

If the house is old, fewer outdoor improvements may be necessary, but you may be fairly certain that you will do some remodeling or make some additions or repairs that should be included in your budget. To provide for these incidental costs is good business and will ensure an investment that does not prove burdensome.

The practices of lending agencies differ so widely in different sections of the country that it is impossible to describe exactly how the loan that you may arrange will be paid to you. However, two practices of all lending agencies are common enough to be referred to as rules. First, the lending agency will not accept a mortgage on a house under construction until it has reached a certain stage of completion, usually when it is under roof. It is customary for the lender to make at this time a partial payment of one-third or one-quarter of the amount of the loan. Secondly, the amount of the loan for new construction will be paid at

intervals as the work progresses. It is common to receive another third of the total amount when the building is closed and under lock and key, and the final third after the building is substantially completed. A building is considered substantially completed when the contract has been completed with the exception of a few minor details such as adjusting radiators, cleaning windowpanes, or refinishing scratches. Each time a payment is made, the lending agency will require the contractor to show receipted bills for all materials as well as evidence of payment to workmen and subcontractors. This guarantees that the money you then pay to the contractor is going into your property and is not used to pay off another job while your materials and workmen are unpaid.

If the lending agency does not require the contractor to show receipts but only has him sign a waiver which makes his interests in the property secondary to that of the lending agency, then you are not fully protected unless you yourself require the contractor to show proof of payments before you pay him. Not to make certain is to risk losing the amount of your payment. This is discussed in detail under Liens in a subsequent chapter.

Some lending agencies will not accept a mortgage or make any payment whatsoever until the building is completed, in which case it is necessary to negotiate a construction loan in order to have money available during the period of construction. A lending agency which does not accept mortgages on buildings under construction will, as a rule, negotiate a construction loan for the prospective owner with a local bank. The lending agency and bank then enter into an agreement whereby the bank furnishes the construction money while the building is under construction. When the building is substantially completed, the lending agency pays the bank the full amount of the construction loan and accepts the owner's mortgage for the same amount. Thus the construction loan has been only an instrument by which the building has materialized from drawings to completion; after that the lending agency accepts the mortgage.

### DISCHARGE OF MORTGAGE

At the time of making your final payment on a mortgage, you may receive the original mortgage from the lending agency together with a certificate to the effect that the mortgage has been paid and satisfied. This is called a **satisfaction piece** and must be recorded or filed as local statute may require.

However, it is common practice, too, for the lending agency to record satisfaction of the mortgage, after which the original mortgage is returned to the owner. Whatever the common practice may be in your community, you must insist that the satisfaction of the mortgage be recorded as soon as possible.

You may then burn the mortgage!



# SITE SELECTION

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COMMUNITY—NEIGHBORHOOD—ZONING—NUISANCES—  
IMPROVEMENTS—SEWER—SERVICES—TOPOGRAPHY—GROUND  
WATER—PLOT—RESTRICTIONS—AGREEMENT—TITLE SEARCH  
—DEED

**Y**OU may have a home planned by the most talented architect, built of the finest materials by expert craftsmen, and installed with the most modern equipment, only to find that the location of the site makes the home unlivable.

The site that is selected has an important influence on the home planning, the cost of site development, the protection of your investment, and the welfare of your family.

Many prospective owners in their enthusiasm to acquire a home do not thoroughly study the problem of site selection. They lack knowledge and they trust to luck. They act in haste and possibly repent at leisure.

The problem is essentially the same whether you are buying vacant land or land upon which the house is already built. Conditions vary, but the procedure followed by many prospective homeowners will be helpful in solving your own problem of site selection.

You should begin with a study of the separate communities that are within the range of possibility. Communities have distinctive character—like people. Some are rich, some poor; some are well-groomed, others unkempt. The community may be a small town, a suburban village, an area within a larger town or city, or a rural community with houses half a mile apart. Decide first whether the general character of the community will satisfy your needs and the needs of your family and will be conducive to your particular habits of living.

Next, investigate the stores. Usually you must patronize local stores. Check whether they will satisfy your wants as well as your pocketbook. You may not like the stores too near; neither will you want them too inaccessible.

Schools deserve consideration whether or not you have children of school age. Inadequate schools adversely affect the resale value of a house because persons who have children will not be interested in the property. Conversely, good schools tend to increase the value and desirability of property.

Determine whether or not the community is a safe place in which to live. Is there adequate fire and police protection? Is the traffic properly regulated? What is the general reputation for safety?

Consider the churches in the neighborhood. Your family may want a certain church not too far away, though you prefer not to have one next door or even close by. Regardless of your own interests, however, the saleability of property is increased by the proximity of churches of several denominations.

## SITE SELECTION

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Transportation is an important item. Must you walk, use your car, a bus, a streetcar, or commute by train? There may be several facilities available, and usually the more the better. Give attention to the needs of each member of your family—for business, school, and social activities.

It is to your interest also to investigate the general reputation of the local government. Determine, if possible, whether there is an efficient, fair, and honest administration of the local community affairs. The administration of the local government has a direct effect on the assessment of taxes you will be required to pay on your property, and of course on the type and quality of service you get in return for your taxes.

Does the community have recreational facilities which will meet the needs of each member of the family? Theaters, movies, golf, tennis, swimming, baseball, gardening, and many other individual forms of recreation may be of interest. Parks and playgrounds are desirable attributes to any community. Perhaps these have no importance to you, and very likely you may not want such facilities next door or across the street. However, parks and playgrounds in a community tend to increase the value of property by making it more attractive to those who want such facilities. .

After reaching a decision on the community that appears to offer most possibilities for the satisfaction of your wants, you will next explore the various neighborhoods or sections within the community. Check each section with respect to stores, schools, churches, safety, transportation, and recreation as you do when you select the general community.

The suitability of a neighborhood is a relative matter. Some families have always lived near stores, schools, and churches and hesitate to change their habits. Others are accustomed to walking a considerable distance as a matter of course.

The selection of the neighborhood involves further investigation of a more personal nature. Is the general environment right for your family? A neighborhood which may be satisfactory to one family may be out of the question for another.

The selection of the site as well as the planning or the selection of a house is a constant problem of self-analysis. Always ask the question, "Will it suit the needs and the habits of our family?"

The general environment and the quality of a neighborhood are in some respects identical. **Quality** refers to the particular characteristics of the neighborhood. It includes such items as these: Are buildings new and attractive, well painted and repaired? Are lawns and shrubs in good condition? Are streets and sidewalks clean? The quality of a neighborhood affects its property values. It is generally easier to obtain a loan with property as security if the location is in a neighborhood of good quality.

In considering quality, ask also whether the area is large enough to maintain the present quality over a considerable period. Is the neighborhood of a transient nature, or will it remain stable?

You will naturally want to know the character of people living in the neighborhood. Perhaps you may choose not to be intimate with your neighbors, but



in any event you will meet them on the walks and in the stores. You will find life much more pleasant in a neighborhood where the people are congenial and neighborly. Remember that people near your own social status and financial level will be most conducive to contentment. The ideal neighborhood is one where others have essentially the same likes and dislikes, ideals, hobbies, income, and interests as yourselves.

Learn something of the past and possible future expansion of the neighborhood. Try to determine any factors that may affect its future development. Will the trend be toward commercial encroachment on the neighborhood from stores, garages, gas stations, and restaurants? Will there be a trend toward industrial encroachment by shops and factories? Is a trend toward the expansion of adjoining neighborhoods likely to increase or decrease the value of the property? In many communities there is a definite trend of expansion of racial groups which may or may not influence your decision to locate within the neighborhood.

The history of the neighborhood merits your consideration. Is it new and growing? Or is it an old neighborhood that has reached its peak and is now becoming decadent? Have the real estate values remained fairly constant? Have values decreased or increased? Behind any change in real estate values you will generally find some historical reason. Consequently, learn what you can about the history of your neighborhood. Have the families remained in the neighborhood for years? What type of new families has it attracted? Why have families left the neighborhood? Have the people generally been homeowners or tenants? These are representative questions about the history of the neighborhood that should influence your decision to buy or not to buy there.

Neighborhoods generally rise and decline according to a general cycle. The cycle may be completed within several years, or it may require many. Rarely does the desirability of a neighborhood remain stationary. It may increase or decrease. The usual cycle is as follows: In any new real estate subdivision or development there is a period of uncertainty during the first-settler stage. This continues until a sufficient number of houses have been built to set the pattern of the neighborhood. If the neighborhood is attractive, the tendency is for it to increase in desirability until almost all the vacant sites are developed into home units. Before the few remaining vacant sites are utilized for building, the appeal may then shift to a new section and the neighborhood in point will have begun the downward trend. As soon as this happens, the once "new neighborhood" becomes an "old neighborhood," relatively; it no longer has its original appeal.

In certain localities it is common for real estate developers to build an entire neighborhood of homes as a single development. This eliminates the period of uncertainty about the pattern of the neighborhood.

The rise and decline of neighborhoods is not confined to cities, but can be observed in small towns, suburban villages, and even in groups of houses in the country. Restricted communities where properties are well maintained are not entirely immune from the cycle of rise and decline, but obviously the better maintained neighborhoods remain desirable over a longer period of time. However, newer sections naturally create a stronger appeal and attract occupants from older neighborhoods.

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Concerted effort by the homeowners in the neighborhood may be effective in retarding the usual decline. Restrictive agreements are helpful, and deed restrictions have a similar advantageous effect in retarding the rate of decline.

Homogeneous neighborhoods tend to suffer less from decline. Where occupants of the neighborhood own houses of about equal value, have incomes within about the same bracket, belong to the same racial group, and in other ways represent similarities rather than differences, the decline in the desirability of the neighborhood is less rapid. Differences in home value, income, racial groups, and social status cause discontent, frequent changes in occupancy, and a consequent increase in the rate at which the neighborhood declines.

The decline of a neighborhood may be accelerated by certain influences. The migration of a racial group or the location of a factory in or near a residential area may decrease the desirability of the neighborhood. Consequently, values decline and lower income groups occupy the homes. Generally where incompatible groups occupy the same neighborhood, those having the least interest in the maintenance of their property drive out the group whose interest is to preserve the quality of the neighborhood.

Adjoining the downtown business district there is usually a fringe of the oldest and most dilapidated houses which are used as dwellings. The residents are with few exceptions tenants. Old buildings occupied by these people probably once housed the aristocracy when this was the new neighborhood of the city in its youth.

As a general rule, a neighborhood that is occupied by homeowners is better maintained than one occupied predominantly by tenants. Obviously an owner-occupied neighborhood is more stable. A tenant usually has only temporary interest in the home he occupies. Ordinarily he has no incentive to keep the property in repair, and much less to make any improvements. The owner of tenant-occupied property generally has a different interest from that of the owner who occupies the house himself. An owner-landlord usually spends only to keep the tenant reasonably content and to keep the property from deteriorating too rapidly. If conditions develop that render the property or neighborhood undesirable to the tenant, he moves to a different house or to a different neighborhood.

As occupants of houses move to new neighborhoods, the used house is generally sold at a reduced price, the new owner is a person with less income than the original owner, and each time the house is sold it will ordinarily go to a new owner having less income. Eventually through a series of changes in ownership, coupled with general depreciation and decline, a large house once occupied by the wealthy may become the home of the casual laborer. Through the continued change of occupancy and the incessant competition of new neighborhoods the cycle of decline of the house continues until it ultimately reaches the slum classification. Each house passing through the cycle of decline contributes to the general decline of the neighborhood. Eventually the neighborhood becomes a slum area.

Considering the inevitable cycle of decline of neighborhoods, the question naturally arises as to the desirability of owning a home and whether it is cheaper to rent than to buy or build. Despite the facts that neighborhoods may change

and decline, that property may depreciate in value and may become obsolete, when all factors are taken into consideration the advantages of owning one's home are favored in the minds of most people.

The home and the automobile are closely associated in our experiences. The ownership of each is quite parallel. You might reasonably ask, "Is it cheaper or better to hire taxicabs than to buy an automobile?" For many of us it would be cheaper. When we think of tire trouble, motor repairs and maintenance, it would probably be better not to own a car. However, when we consider the convenience, the pleasure of driving, the pride in ownership, the privacy, most of us favor owning a car. In our minds the advantages more than outweigh the disadvantages. To be sure, there are exceptions. For instance, in New York City people who could afford to own their homes and to own automobiles do without one or both. Traffic congestion and the availability of other forms of transportation make car ownership unattractive. The lack of desirable single-family units and the conveniences of apartment life induce people to prefer renting.

The automobile is sure to depreciate in value, but where there is a general rise in values many homes have been sold at cost or at a profit. The automobile has a parallel cycle of decline which is normally far more rapid than the decline of a house. The fine new car is purchased new by the man of higher income. After the car is used a few years, it is "traded in" and is sold to a person usually of lower income. Finally a person of the most modest income may own a large car which he buys at a greatly reduced price. Eventually the car is sold for junk, which is comparable to the decline of homes to the slum classification. The decline of the car may occur within a few years; the decline of a home may not occur to a comparable point even in a generation.

A rented home ordinarily represents a profit to the landlord. All the costs of ownership, taxes, depreciation, and insurance are passed on to the person who rents plus the profit of operating the property.

### ZONING

Zoning has been adopted in communities to stabilize real estate values, to protect owners against drastic changes in the use of buildings and land, and to assure owners that development or occupancy beyond their lot lines will not be injurious to their interests. However, the fact that the neighborhood is properly zoned does not afford definite assurance that the zoning regulations can and will be enforced, or that these regulations will not be changed.

With respect to zoning, it is important to know what provisions, if any, are made for changing the zoning regulations. If they can be changed too easily by some political group, these regulations are of little or no value. If the zoning regulations are "perpetual," on the other hand, this might also prove undesirable since no one is so reliable a prophet as to forecast the needs for fifty or a hundred years. There should be some provision for the change of zoning regulations to provide the flexibility necessary to meet the needs of future development. These regulations should preferably permit the property owners to have direct control by vote or petition to decide whether or not the change is to their best interests.

If the neighborhood is zoned as residential, you should know whether

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“residential” means multiple as well as single dwelling units. Does the residential zoning include flats and apartment buildings?

Commercial zoning usually includes stores, gas stations, garages, and similar establishments. To locate close to the commercial zone is convenient, but there is a tendency for the commercial zones to expand. In cities the old residential neighborhoods adjoining a commercial district usually represent a “fringe”—an area of depreciated home values. The fringe may have an increased value for commercial occupancy, but to reap the benefit of the increased land values would require extensive remodeling or rebuilding.

Most communities rely on industry for their existence. Industries are located only after expert analyses are conducted. There are definite reasons, such as freight facilities, water, and accessible materials, for the location of industries. Because these reasons are not the same as those governing the selection of a site for a home, desirable residential communities adjacent to industries are the exception rather than the rule.

### NUISANCES

A nuisance is an annoying, unpleasant, obnoxious thing or practice. Some nuisances are practically unavoidable. However, if nuisances can be eliminated or diminished by the selection of a site, it is desirable to do so.

**Smoke and dust** are nuisances which may originate at some distance from the site as the result of industrial operations, railroads, motor traffic, amusement parks, and other causes. Smoke is not only unpleasant, but it results in additional cost of painting, decorating, and cleaning. You will observe that smoky neighborhoods are generally neighborhoods of depreciated values.

**Noise** is an annoyance that results in depreciated values. The possibility of noises emanating from industries, railroads, traffic, generating plants, farms, and other sources should be investigated. It is possible that the distracting noises will not occur during your visit to the site, but may occur only at certain times of the day.

**Odors** from manufacturing processes, packing houses, or refuse dumps may induce a nuisance at some distance from the source. The odor may be carried from a distance and will usually be noticeable only when the wind is from a given direction. Perhaps the odor may not be noticeable at the time of your visit to the site, but it may be most offensive to you after you have purchased it.

Not only may **traffic** be a nuisance from the standpoint of noise, but along heavily traveled highways traffic may be a constant source of annoyance from the vibrations imparted to the building. Furthermore, traffic that is a hazard to the safety of children reduces property values.

Parking cars in front of the property can perhaps not be avoided, especially if the location is near a business center or place of amusement. However, if there is a choice of sites, other things being equal, the site without the inconvenience and disturbance of constant parking would be preferred.

Many communities have ordinances prohibiting **chickens and other livestock** within the city limits. This item should be investigated before deciding upon a site. In rural locations where livestock is kept, it is desirable to purchase a large

enough plot so that you may be assured that pigpens, barnyards, or similar nuisances will not be too close to your residence.

## IMPROVEMENTS

In the selection of the site, check on the improvements that are already available. The cost of these improvements is passed on to the buyer in the purchase price. Check too whether the improvements are paid for in full or whether assessments will continue over a period of years.

Improvements represent an original cost which increases the value of the property. They also affect the maintenance costs, which are passed on to the owner in the form of taxes or assessments. In selecting a site, give attention to the tax rate, the assessment valuation, and the annual charges. In some locations the taxes may be burdensome or even prohibitive. Rural property, on the other hand, though generally not taxed heavily, may lack the improvements you wish. You must pay for improvements. The main problem is to get your money's worth.

Under improvements the first item to consider is the **paving**, which includes the streets, curbs, and sidewalks. If these are not installed, estimate the cost of installation. The paving will be an added cost to the development of the site. If the paving is in poor condition and will require repair or replacement, do not neglect to make allowances for the future expenses that will be incurred.

**Trees and other plantings**, whether along the park space between the sidewalk and curb or on the lot itself, enhance the value of the property and are also reflected in the purchase price. Are plantings and trees in healthy condition? Will the replacement of trees in the near future be an added cost or an assessment?

**Street lighting** is a desirable adjunct to the property. Check whether the cost of the lighting installation is partially or fully paid. Is present lighting adequate? Is it likely that the installation may be replaced at an additional cost to the lot owner?

**Fire protection** should be investigated. Are the fire hydrants installed and connected for use? At least one unscrupulous real estate developer tricked buyers into believing that water mains and fire protection were available by placing fire hydrants in the ground in the manner of fence posts. To the amazement of the buyers, they had the additional expense of installing a water main and connecting it to the fire hydrants. Fire protection also includes fire-fighting equipment and personnel. Adequate fire protection means protection of life and property as well as reduced insurance premiums.

**Water service** is taken for granted by city dwellers and especially persons accustomed to living in apartments, but if you plan to locate in the country or beyond the city mains, it may be a real problem. Before buying any property, assure yourself that an adequate supply of safe water will be available. If it is necessary to provide a well, investigate the possibilities of obtaining water and the cost of a well, pumping equipment, and piping.

If you have ever seen the motion picture *George Washington Slept Here*, you will recall a few of the difficulties that arise from the problem of water supply. Few improvements are of greater importance. The supply of water may be ade-

## SITE SELECTION

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quate during the spring rainy season, but the well or other source may go dry during a summer drought. Sometimes the limited supply of water during dry weather may be unintentionally drained away by a neighbor who has a deeper well. To be without water for even one hour, especially if you have guests, can be very embarrassing. Property with a failing water supply is almost impossible to sell except to a gullible buyer.

Safe, drinkable water is as essential as an adequate supply. Water can be contaminated from barnyards, outdoor toilets, cesspools, cemeteries, sewers, industrial establishments, or other sources which may be some distance from the well or other source of water supply. Conditions causing contamination of the water supply are dependent upon surface drainage and the subterranean formation of the locality. Rural water supplies should be tested for purity. If there is any recent history of sickness such as typhoid fever due to a polluted water supply, it is obvious that you should avoid locating in such a locality unless the situation has been definitely corrected.

If an adequate supply of safe water is available, estimate the cost of drilling a well. Private wells including pumping equipment may cost anywhere from \$100 to \$3,000, depending on the depth required to drill the well. You should certainly investigate the cost of wells in the vicinity before entering into any purchase agreement, if water is not already available.

If the water main must be extended some distance, estimate the cost of such an extension. There may be a water main within reasonable distance, but the municipality may not have jurisdiction or authority to extend service beyond a certain limit. In some instances the extension of a water main may require the action of a political authority. In any event, you should have the water-supply problem solved and be assured of an adequate supply of safe water before purchasing property.

If so-called "city water" is available, is there a water main in the street in front of the property, or will the water main have to be extended? If so, what procedure will the extension involve and what will be the cost? Furthermore, if a water main is in the street, has a service connection been made with a pipe leading to the lot? If not, will it be necessary to tear up the street paving to make the connection?

The water supply should be furnished at adequate pressure at all times to reach the highest floor of the building. In some locations water pressure is inadequate at critical times and may not permit the use of toilet facilities on the second floor. If the water pressure is too high, this can be easily corrected at nominal cost by the installation of a pressure-reducing valve, but if the pressure is too low, the situation could be corrected though at greater expense. This would involve an additional expenditure for a pump—an additional item of cost of installation, operation, and maintenance.

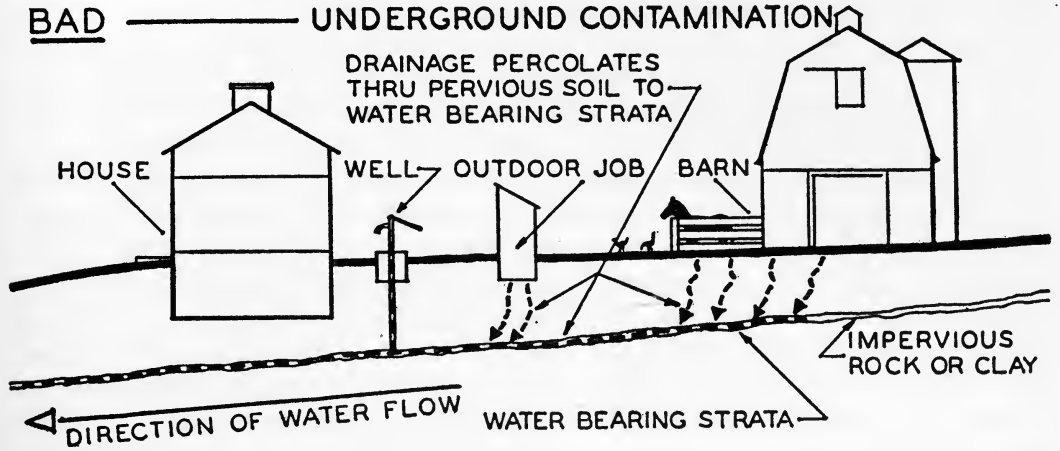
Water should be available in sufficient volume so that it can be used for all purposes, including sprinkling the lawn and washing the car. In some localities sprinkling and washing are prohibited during periods of dry weather. In some localities adequate volume is not available at all times during the day and storage facilities must be provided to assure a continuous supply of water. Such a location



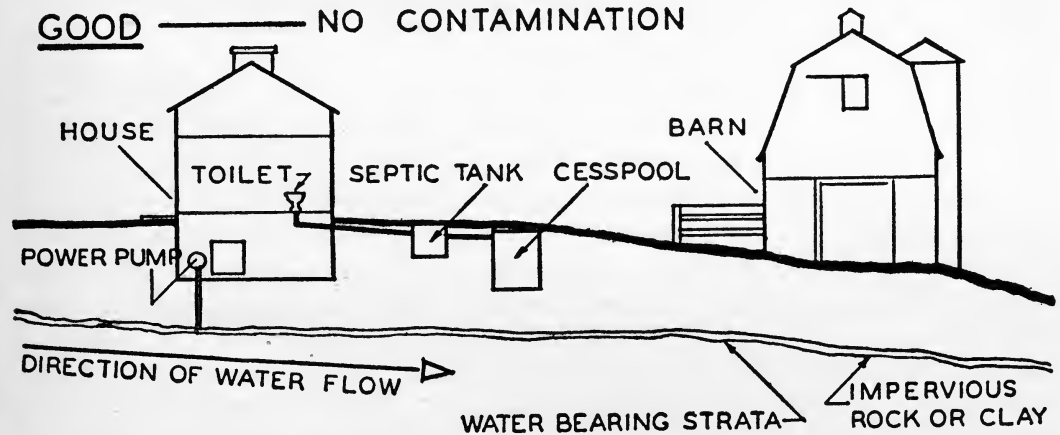
should be avoided, if possible, because of the additional cost and inconvenience of providing and maintaining water-storage facilities.

City water supplies are tested for safety and purity by the authorities. Chlorine or other chemicals are added to the water for health protection. Rural or private water supplies should be tested periodically to determine their purity. These tests are usually made by sending water samples to the state department of health or to a bacteriological laboratory. Care should be exercised in locating a well for private supply to avoid the possibility of contamination from barnyards, outside toilets, sewers, or other sources.

## BAD ————— UNDERGROUND CONTAMINATION



## GOOD ————— NO CONTAMINATION



Water may be sufficiently pure to be safe but not potable. It may be discolored, cloudy, odorous, and still safe for drinking. Water may also contain dissolved chemicals which affect its taste or drinkability.

Water may be of such a degree of hardness as to make laundering or dish-washing difficult without the installation of a water softener, an additional item of expense. Hardness of water results from magnesium and calcium salts that are dissolved in the water. When hard waters are heated, there is a tendency for the

water to "lime" the plumbing pipes, the hot water heaters, and the storage tanks. This liming effect is often sufficient to clog the pipes. Extremely hard water "limes" piping rapidly, especially when the temperature of the water is greater than 120 degrees. Soft water is preferable, but not always obtainable.

### SEWERS

**Sewers** are improvements, but they too are of such importance that they will be discussed separately. Determine whether or not you can get a sewer connection without the extension of the sewer to your property. If not, ascertain the procedure and the cost to obtain sewer service before entering into the purchase agreement.

If there is a sewer in the street, what will be the cost of a house sewer connection? Perhaps the house sewer connection has been made to the sewer main so that the paving will not have to be cut. If so, the cost will be nominal.

Provision for drainage of sanitary wastes and also for the drainage of storm water must be made before the house can be occupied. The drainage in each case is accomplished by some type of sewer system. Sewers that are used for the drainage of sanitary wastes from toilets and plumbing fixtures are known as **sanitary sewers**. Sewers used to drain away rain water, melted snow and ice are known as **storm sewers**. Sometimes both the sanitary and storm drainage are carried by a combined sanitary and storm sewer. It is essential to determine what facilities are available for both storm and sanitary drainage at the time of the selection of the site.

For sites located beyond the city sewers or in towns where sewers are not available, it is necessary, at additional cost to the owner, to provide a private disposal system. Sanitary wastes are usually drained to a septic tank that has a suitable overflow to a drainage system of tile piping or to a cesspool. Storm water is drained to a dry well, a leaching pit, or a cistern, or is discharged on the surface at some distance from the house, provided it will not interfere with the property of another owner. A site served by adequate sanitary and storm sewers is preferable to one that must be served by private systems.

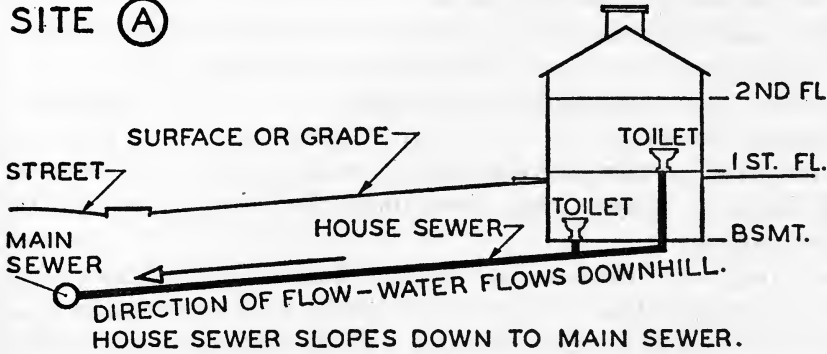
The depth at which the sewer is located with relation to the lot is important. Sanitary drainage from plumbing fixtures flows downward by gravity to the sewer. If the lot is lower than the street, the sewer may be too high to permit drainage into the sewer. Remember, water will not run uphill. Pumps can be installed to raise sewage to the level of the sewer, but such pumps are too expensive to warrant their installation in homes. Sewer service may be available at the site but may not be accessible. Drainage from roofs, paved yards, and basement entranceways flows downward by gravity to the storm sewer. If it is necessary to raise the storm water to the level of the sewer, the storm water may be pumped, but it is undesirable to incur the cost of installation, power, and maintenance of a pump for this purpose unless there is no other alternative.

The depth of the sewer at the building site has a direct effect on the planning of the house. Toilets and other plumbing fixtures including floor drains in the basement are not feasible without the pumping of drainage unless the sewer is lower than the basement floor. In some instances, especially in sites which slope



downward from the street, the sewer may not be lower than the first floor of the proposed building. In order to provide drainage by gravity the level at which the

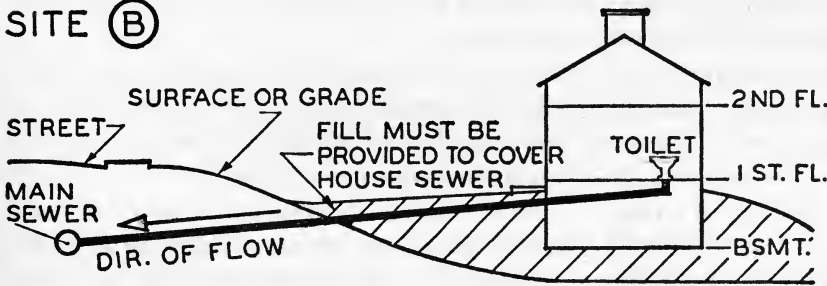
## SITE (A)



THIS HOUSE CAN HAVE PLUMBING FIXTURES THRU-OUT, INCLUDING THE BASEMENT, THAT "WORK".

MAIN SEWER IS LOWER THAN THE BASEMENT FLOOR.

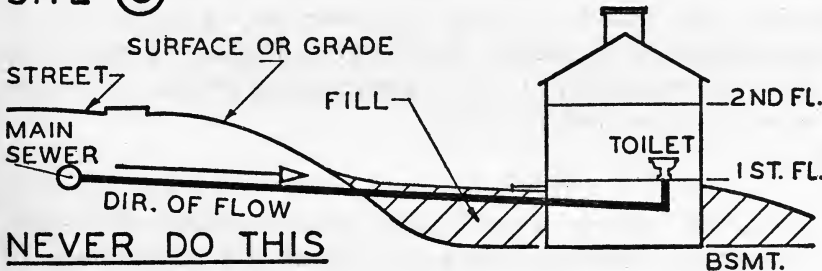
## SITE (B)



IN THIS HOUSE BASEMENT PLUMBING FIXTURES ARE IMPRACTICABLE.

MAIN SEWER IS NOT LOWER THAN THE BASEMENT FLOOR.

## SITE (C)

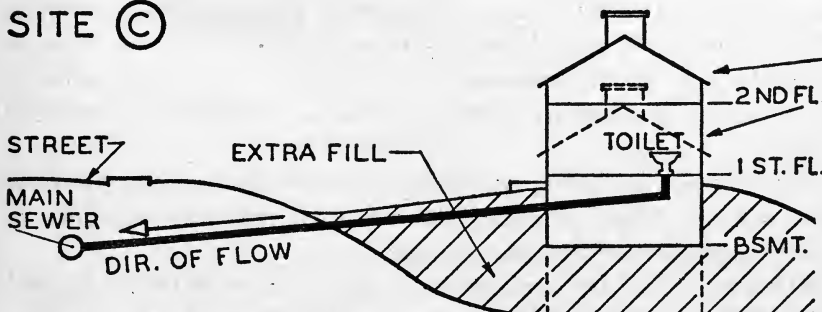


IN THIS HOUSE THE CONTENTS OF THE MAIN SEWER WOULD DRAIN INTO THE PLUMBING FIXTURES.

MAIN SEWER IS HIGHER THAN THE FIRST FLOOR

FLOOR LEVELS ARE TOO LOW, AND ENTIRE HOUSE MUST BE RAISED AS SHOWN BELOW

## SITE (C)



TO USE THIS SITE WOULD MEAN EXTRA WALLS AND EXTRA EARTH FILL.

floors of the building may be placed is dependent upon the level of the sewer. Consequently, the level at which the floors are placed often determines the entire

planning arrangement of the house. A house that can be built successfully on one site might be out of the question on another because of the depth of the sewer with relationship to the floor levels of the house.

Sewers should be accessible directly from the lot. It should not be necessary to cross property owned by others in order to make a connection.

Main trunk sewers are sometimes not accessible for branch connections. You may be so near and yet so far.

Sewers are sometimes installed across private property, but this leads to complications and affects planning. A main sewer under the house or through the basement should be avoided.

Sewers are not always adequate in size to carry off drainage as rapidly as is necessary for the proper operation of plumbing fixtures, floor drains, and roof drains. Investigate the capacity of the sewers by making inquiry as to whether storm water and sanitary drainage are carried off satisfactorily at all times from existing houses which are served by the sewer.

In some cases the sewers that carry off the storm water on streets are inadequate. This results in the periodic flooding of streets to a depth of several feet of water. The city engineer's office can tell you about the size and capacity of the sewer or sewers which serve the site you have under consideration.

A reversal in the flow of a house sewer is possible. A main sewer of inadequate size when overloaded may cause the flow in the house sewer to be reversed. This results in a flow from the main sewer through the house sewer into the building. In other words, the contents of the sewer may flow backward into the house through floor drains or toilet fixtures and into the basement, or if the sewer is not much lower than the first floor, even to the first floor. Backwater valves can be installed to avoid a reversal of flow, but it is preferable to select a site where the possibility of reversal of flow does not exist.

### SERVICE

An investigation should be made of the various services available at the site. These include electricity, gas, telephone, garbage removal and similar items of service.

Determine whether **electricity** is readily available. If an extension of the electrical service to the site is necessary, is there a charge to the owner? If there is a charge for the extension of service wires and poles to provide electric service, how much will it be? Extensions of service may represent a sizable cost item in site development. If the cost of the extension is a relatively large expenditure, it might be well to consider another site where service is available at a nominal cost.

If electricity is available, is the service adequate? Overloaded electric lines mean unsatisfactory service. Check whether there are frequent interruptions in service. Find out the rates charged for electric service.

If **gas** is available, what will be the cost of piping the service to the house? What are the rates? If the rate for gas and the cost of installation are too expensive, you will probably consider the use of other means for cooking and for the heating of water.

Check whether **telephone service** is readily available. If an extension of the line to the house is required, what will be the charge, if any? Also check what types of service are available and the rates. In rural locations it may be necessary to be served on a time-honored party line which is generally unsatisfactory to persons accustomed to urban telephone service, or to pay high rates and possibly to incur an expensive installation cost and monthly service rate for urban service.

Service for the **removal of garbage** is important. Is the garbage collected at regular intervals, so as to insure against odors and unsanitary conditions? Are garbage cans collected at the front or rear of the property? Unsightly garbage cans, emptied at irregular intervals, are not conducive to the best appearance of the neighborhood. Appearance affects values of property.

Determine what provisions are made for the regular **removal of ashes and trash**. If these are permitted to accumulate in plain sight, it is detrimental to the appearance and to the value of property in the neighborhood. Like other items of service, inquire as to the cost of removal of ashes and trash. In some localities unreasonably high rates are charged.

Do not overlook the type of **mail service** which is available at the site. There are locations where there is no delivery service of mail and you may be required to call for it at the post office. This may be some distance away and not on your regular route of travel.

In locations subject to heavy and frequent snowfall over a long winter period you should inquire as to the service rendered in the **removal of snow** from the streets. If you are interested in a rural location, you should try to locate on or near a highway where the snow is removed by snow plows operated by the highway department.

### TOPOGRAPHY

If these general considerations have been checked to your satisfaction and you are now interested in a specific building site, the topography at the site is important since it directly affects the cost of site development. If your funds are limited, the more you spend on site development, the less money you have available for the building of the house.

The **topography** of the site refers to its various surface characteristics such as slope, direction of the slope, steepness of the slope, knolls, gullies, ravines, swamps, streams, rocks, and roads.

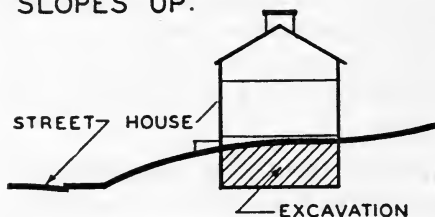
In the planning and building of a house on a vacant site all the existing surface features must be taken into consideration. Each of these has a bearing on the cost and the arrangement of the completed house.

A flat or nearly level site usually involves the least cost in site development, though it does not generally produce so interesting a setting for a home as a sloping site. With a level site the earth excavated for the basement is generally hauled away by the builder. This is a variable item of expense, depending on the length of the haul and on the possibility of using the earth fill at another project. Some of the earth excavated from the basement may be used to raise the grade at the building to provide a gentle slope of the surface away from the building. It is always good practice to have the grade slightly higher at the building so that

## SITE SELECTION

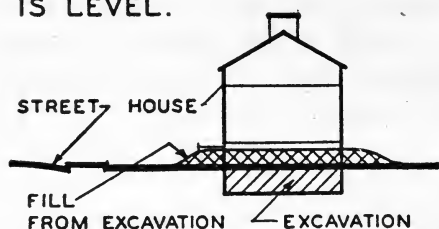
the drainage of surface water will be away from the building. Conversely, it is poor practice to grade so that the drainage will be toward the building. When the basement is excavated, it is necessary to excavate a hole larger than the basement in order to build the basement walls. If the space between the basement wall and

THIS SITE  
SLOPES UP.



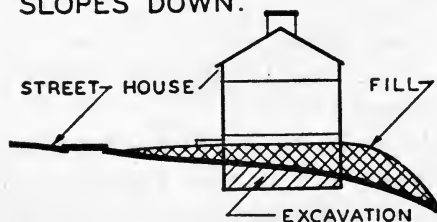
EXCAVATED MATERIAL  
MUST BE HAULED AWAY

THIS SITE  
IS LEVEL.



EXCAVATION PROVIDES  
MATERIAL FOR THE FILL.

THIS SITE  
SLOPES DOWN.



EXTRA MATERIAL MUST BE  
PROVIDED FOR THE FILL.

the undisturbed earth is backfilled, there is the tendency for the backfill to "settle." Consequently it is desirable to allow for this settlement by grading slightly higher at the building.

A site that slopes gently upward from the street is considered by many homeowners the most desirable from the viewpoint of interest and attractiveness. There are other advantages to such a site. It is well drained toward the street which is provided with sewers to carry the water away. It places the house at a higher elevation above the sewers, which are generally located in the street; the higher the house is above the sewer, the better the drainage from the house to the sewer.

A site that slopes gently downward from the street may be developed satisfactorily, but requires careful study. Owing to the slope there will not be so much excavation required for the basement. The excavated earth can be used for fill to grade the site, though it may be necessary to have additional earth fill hauled in to bring the grade to the level desired. The cost of the fill may be reasonable or be prohibitive in cost, depending on the length of haul and the availability of earth fill at the time. Earth fill is not fertile topsoil, except in rare cases; so you must count on covering the fill with topsoil from your own site, or buying it and having it hauled from some other location. With any site that slopes away from the street, the depth of the sewers should be checked to assure that it is possible to drain plumbing fixtures to the sewer by gravity. There are many successful and interesting site developments made by terraces which are utilized in a site of this type. Usually the site that is

lower than the street presents more of a challenge to the skill of the planner than the level site or one sloping slightly upward.

The building site should always be well drained. This is readily accomplished on a sloping site located on a knoll or slight rise of ground. You are cautioned that some sites are located in drainage pockets where surface water from the surrounding land flows toward the pocket, creating an undesirable damp or wet condition unless some provision is made to intercept the natural drainage.

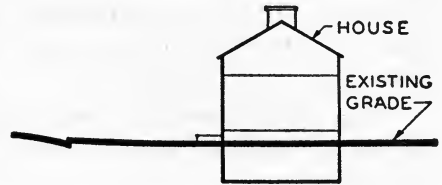
Sites having steep rather than gentle slopes generally involve greater expense in site development. Such sites may require retaining walls, steps, or terraces. Retaining walls are costly to build and to maintain. They represent money that could be spent otherwise to improve the quality or size of the house.

Sites having steep rather than gentle slopes generally present a more serious drainage problem since the runoff of surface water is more rapid and the flow of water is apt to be concentrated.

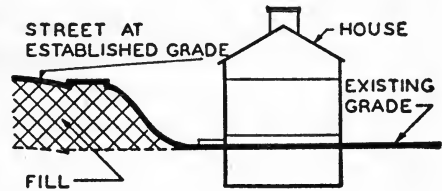
For the proper drainage and construction of streets and sidewalks it is sometimes necessary to cut away earth from certain locations and to fill in earth elsewhere. In planning the streets and the sidewalks it is necessary to assign "established grades" which are the official grades set by the authority of the city engineer. If an existing roadway or sidewalk is not at the established grade, the existing grade may have to be changed to comply with the established grade at some future time when new streets and sidewalks are built. The raising or lowering of the existing grade may seriously affect your planning and your costs. Determine whether or not the existing grades are the established grades, especially if the sidewalks are not in place at the time the lot is purchased. If they are not, learn how much lower or higher the established grade will be and plan accordingly.

If there are streams on or near the site, you should find out the highest level that the stream has ever reached, and whether the site has ever been flooded. In locations subject to high tides, or to the effect of tides on streams, it is well to investigate

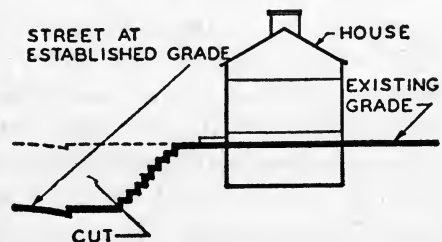
SITE BEFORE PAVING  
IS INSTALLED AT  
ESTABLISHED GRADE



WHAT MAY HAPPEN IF  
ESTABLISHED GRADE IS  
HIGHER THAN  
EXISTING GRADE.



WHAT MAY HAPPEN IF  
ESTABLISHED GRADE IS  
LOWER THAN  
EXISTING GRADE



## SITE SELECTION

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the possibility of flooding. Sites that have been under water should be avoided unless conditions have been positively corrected. Buildings and building sites that have been flooded represent depreciated values. They do not attract buyers and are difficult to sell even at low prices.

The general topography of the land in the vicinity of the site should be studied as well as the specific topography of the site.

The site under consideration may be on a hilltop with an excellent view of the city or the surrounding countryside. This is highly desirable, especially from the standpoint of summer breezes. However, you should also consider the exposure of the site to harsh, penetrating winds during the winter months. Perhaps the hilltop location can be reached only by encountering steep grades that cause difficulty in icy weather.

The site located near the bottom of a steep or narrow valley may have only a limited outlook and may be cut off from summer breezes, but it will be protected from the exposure of winter months. It may get a concentration of drainage from the surrounding hillsides. The valley site may also be subject to the difficulty of encountering slippery icy roads on steep grades during winter months.

In considering the characteristics of the site you should determine whether the surface is the natural one or whether it has been changed by excavation or filling. A building site that represents the natural surface of the ground is generally the more desirable. It can sometimes be determined by inspection. Large trees are usually evidence of a natural surface. In the absence of trees, the character of the vegetation will offer some indication. A test pit will offer conclusive evidence of the presence of a natural surface or a filled surface. To avoid difficulties which can have legal implications, permission should be obtained from the owner before a test pit or test hole is dug.

If there is any question in your mind, local inquiry from qualified persons such as builders and architects or consulting the records in the city engineer's office will be helpful in determining whether the surface is the natural one.

There are a number of reasons for the desirability of the natural surface. Suppose a hill or knoll existed originally on the site and that it has been cut away to make the site nearly level. The fertile topsoil for the lawn or garden is gone, though a thin skim of topsoil may have been replaced over the clay or other subsoil. It may be necessary to buy additional topsoil, which means an added cost to the site development. The removal of the hill may mean that rock is within the depth planned for the basement, which necessitates more difficult excavation and added costs.

Suppose, on the contrary, that the site was originally a ravine or a valley. This ravine may have been filled with ashes, trash, or garbage. It may have been filled by grading down an adjacent hill, or by dumping excavated material from other buildings. It may take years, depending on the type of filled material, before the final settlement of the soil is reached. A house built on this soil settles with the soil, and with certain undesirable results. The sewer and water connections may be broken. The sewers may be too high for drainage of sanitary wastes and storm water after the settlement has taken place. Extra fill of expensive topsoil may be required to bring the lot up to the desired grade. The house may



settle unevenly, causing cracks in the walls and partitions. Houses may be successfully built on fill, but unless proper precautions (which are usually expensive) are taken, it is better to let someone else buy the headaches and trouble which often accompany such sites.

Other surface features to look for are boulders or outcrops of rock. These should serve as a warning that rock excavation may be required. Remember that it costs considerably more to excavate rock and boulders than to excavate ordinary soil. Rock excavation usually involves drilling and blasting to loosen the rock. To load the rock and to dispose of it represents a greater cost than to load and dispose of earth. In the grading of the site you could probably use the excavated earth, but seldom the excavated rock.

Good trees are an asset to the site if they can be utilized in the final plans for the project. However, if the trees are in poor condition or must be removed for other reasons, the trees and the stumps are another item of expense in the site development.

In the selection of a site you should investigate **subsurface** as well as surface conditions. For a private dwelling, test holes to determine the soil and moisture conditions beneath the surface are not ordinarily dug. Nevertheless, the safest method to determine subsurface conditions is to dig a test hole. On a large site or one which may present variable subsurface conditions, more than one test hole is desirable.

If it is a filled site, the character of the fill is important. It may be well-compacted soil or it may be ashes, old bedsprings, trash, or garbage. Large buildings with expensive foundations are successfully built on fill, but the proper treatment of a filled site is usually too expensive for the average homeowner.

The soil at the level desired for the foundation of the house may be one of a number of types. Silt, or finely divided sedimentary soil, has questionable value for the support of a house without excessive settlement, especially if there is too much water in the soil. A house to be built on silt entails an additional expense for foundations that is not usually justifiable for a small home. Sand, especially coarse sand, is generally a desirable foundation material upon which to build a small dwelling. Whenever you think of sand for a foundation, however, you should also think of water. Sand with excess water is quicksand, and that involves expense not justified for small-house construction. Sand that is damp, well compacted, and confined laterally is satisfactory for the foundation of a small house.

Clay is the soil most generally encountered. For small buildings clay is generally a satisfactory soil for the support of the building. It is not usually difficult to excavate. The water content of the clay affects its properties. When wet, clay is like putty; when dry, it is as hard as brick.

Gravel is one of the most satisfactory materials upon which to support a building. It is not difficult to excavate, though it may serve as a plane of reduced resistance for the flow of ground water into the basement.

Rock is capable of supporting a skyscraper, but it is costly to excavate. An excavation in solid rock may form a watertight basin which will hold ground water unless a drainage system is provided.

### GROUND WATER

**Ground Water** is water under the surface of the ground. The water for a well used for water supply is ground water. Ground water may ooze from the surface in the form of a spring; it may be only a few feet below the surface of the ground, or it may be at a depth of a hundred feet. If ground water is near the surface, the excavation for a basement may result in the equivalent of a large well.

Ground Water follows the paths of least resistance. A basement offers a location of reduced resistance into which the water will flow. The ground water may not be always at the same level. In rainy seasons it may rise nearer to the surface while during a dry season there may be no evidence of it. Consequently, it is desirable to know the highest level of ground water and plan the construction accordingly. Basement floors that are at least three feet above the highest level of ground water are generally considered safe against its entry without the installation of waterproofing.

In localities where rock is near the surface, ground water is a problem. Surface water percolates through the topsoil and clay to the level of the rock below, and then flows along the surface of the rock. If the basement floor is near the level of the rock, the water is likely to flow into the basement. During rainy seasons water may thus enter the basement to a depth of several feet, more than enough to extinguish furnace fires and cause damage. In the event that the building is on a sloping site, it is sometimes possible to install a gravity drainage system with underfloor drains which will prevent the water from entering the basement. To prevent this on a level site it may be necessary to pump the water from the underfloor drainage system. Any underfloor drainage system or tile drain around a basement is useless unless the water drains to a suitable discharge or pump that will take it away from the basement.

Basements can be waterproofed, but a satisfactory waterproofing job is more expensive than the average home would warrant. Do not be misled that damp-proofing (usually a coating of the wall) is waterproofing. Waterproofing means keeping the water out.

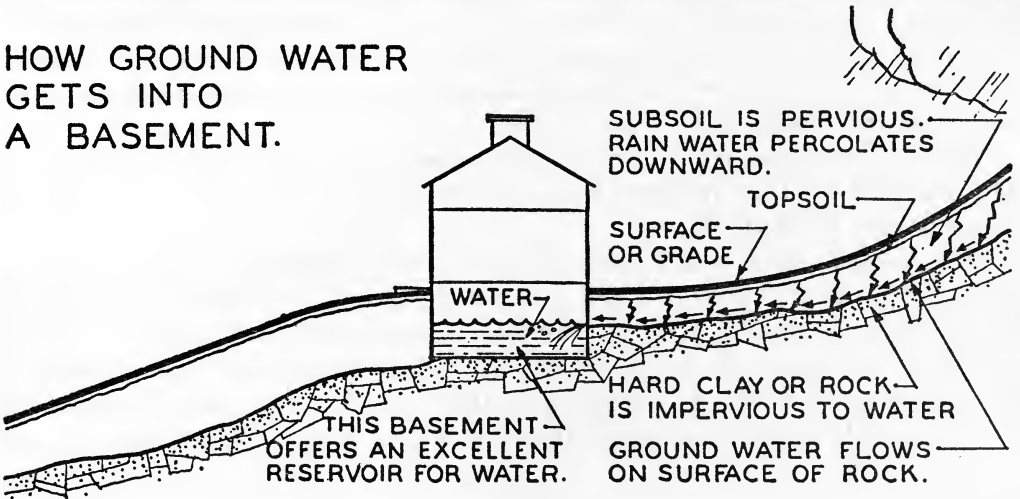
If the basement floor is planned so that it will be below the level of the ground water, the waterproofed basement is like a ship buried in the ground. Since all joints in a ship must be watertight, so it is with all the joints in the basement wall and the basement floor. The ship must resist the pressure of the water that surrounds it, and this water pressure is sufficient to break the ship's joints or to cause some other structural failure unless the ship is built strong enough to resist the pressure. Likewise, waterproofed basement walls and floor should be designed to resist the pressure of the water that may exist outside the basement. Otherwise the water pressure can and often does crack basement walls and floors. Satisfactory waterproofed basements are built for large office buildings, but the cost of doing the job properly is prohibitive for the small home.

If you can find a site to your liking that is not in a location subject to critical ground-water conditions, by all means take it.

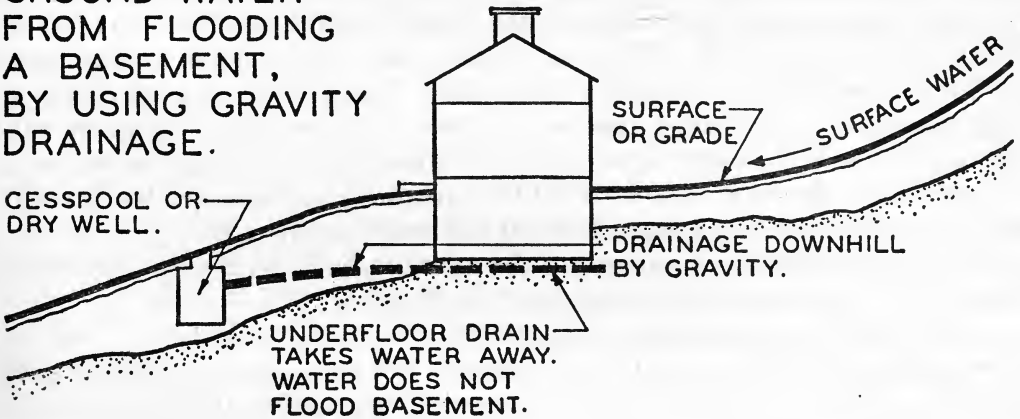
In the event that the site you have purchased and upon which you wish to build is subject to such conditions, it is preferable to design the house without a



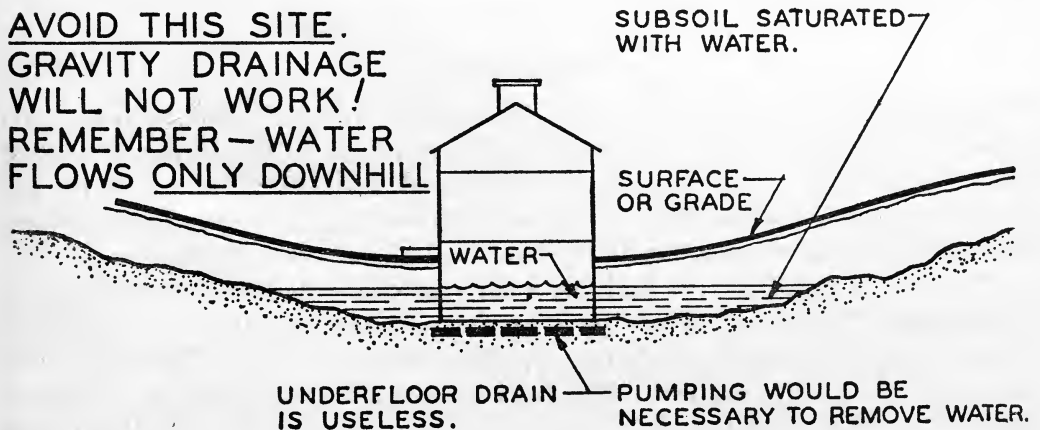
## HOW GROUND WATER GETS INTO A BASEMENT.



## HOW TO PREVENT GROUND WATER FROM FLOODING A BASEMENT, BY USING GRAVITY DRAINAGE.



## AVOID THIS SITE. GRAVITY DRAINAGE WILL NOT WORK! REMEMBER - WATER FLOWS ONLY DOWNHILL



## SITE SELECTION

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basement or so that the basement floor will be at least three feet above the highest level of the ground water. A basement below this level should not be considered unless the ground water can be drained away without developing a critical water pressure on the basement floor and walls.

Before purchasing a site, you should inquire as to the presence of ground water and also whether difficulty has been experienced with water in basements of other homes similarly located.

The house subject to a flooded basement is naturally more difficult to rent or to sell even at a depreciated price. A wet basement is something that should be avoided by exercising prudent foresight in the selection of the site and the planning of the house. A wet basement is a difficult and costly item to correct after the house is built. Any conditions that would cause water to enter the basement should preferably be anticipated in advance of construction.

### PLOT

In the selection of a site study its size and shape before buying. It is desirable to make preliminary studies as to how the house, garage, driveway, garden, and lawn can be arranged. An irregular site should receive careful study before discarding it as a possibility. Many interesting and efficient home arrangements have been accomplished on irregular sites. Many desirable sites in good neighborhoods have been overlooked because of their irregular shape. Subsequently some person devises a plan to utilize the irregular plot and buys the site at a favorable price. However, it is essential that you have a scheme for the development of the site and stick to it unless you can evolve a better one.

In making preliminary studies for the house to build on the site, the orientation of the house should be considered. See Planning.

It is better to determine the adaptability of the site to the house plan you desire before purchasing it than to buy the site and then worry about how to fit the house on the lot. Remember that site planning comes before the down payment which binds the purchase agreement.

### RESTRICTIONS

Restrictions governing a site may not permit you to build the house you desire. Furthermore, these restrictions may contribute to the increased cost of construction and site development. The usual restrictions encountered are building codes, deed restrictions, easements, and covenants. Determine in advance of purchasing a site what restrictions if any will affect your building plans.

In certain localities the **building code restrictions** dictate specific types of construction. These may result in expensive construction that you have not contemplated. The building code may prohibit certain materials. This may mean that you will be required to build a brick or stone house instead of the frame structure you have planned. It is better to know before you buy whether or not such restrictions exist than to suffer disappointments later.

Certain sites are limited by **deed restrictions**. Previous deeds issued for the property may restrict the construction, the cost, the type of building, the location

of the building, or other specific details recorded in the deed or in any previous deeds. Some sites may be affected by easements which constitute a restriction.

An **easement** is the right or privilege to use the land of another person without giving him any compensation therefor. For example, suppose Mr. Smith sells the rear end of a lot abutting on the highway to Mr. Jones, who owns no other property contiguous to the piece at the rear of the lot. The law will imply an "easement of access" across Mr. Smith's lot whether or not Mr. Smith mentioned it in the deed. If Mr. Smith then sells the front part of the lot, the easement would still remain in effect. Easements exist in various forms. An easement may affect in some way your rights to build on the property you acquire.

**Covenants** sometimes constitute restrictions. Covenants are agreements entered into by a group of property owners to accomplish certain restrictions to their common interests. If such a covenant exists, it may affect the plans and the cost for the development of the property within its sphere. The restrictions invoked by building codes, deeds, easements, and covenants can modify your plans, contribute to increased costs, and otherwise dictate requirements so adversely as to make a certain site undesirable for you to consider. They may also have the effect of improving the whole neighborhood.

## AGREEMENT

After you are sure beyond all reasonable doubt that the site you have chosen has fulfilled your various requirements, you are now ready to enter into an agreement for the purchase of the site.

The agreement should be in writing. It should include the scope of the sale; that is, it should specify exactly what you are to get in return for your money. The agreement should include (1) a description and survey of the property, (2) the purchase price, (3) methods of making other payments, (4) interest on any unpaid balances, and (5) the disposition of any encumbrances. The agreement should further specify who is to pay for expenses involved in the transfer of the title.

The agreement should be made contingent upon the present owner's furnishing you with a satisfactory title and deed to the property with provision for return of the first or down payment. It is customary to require that the seller furnish the buyer an abstract which is a record of title of ownership of the land.

Money spent for attorneys' fees in drawing up the agreement is money well spent. Unless you are especially qualified, you should not attempt to draw up the agreement without the advice of a competent attorney who is experienced in real estate transfers.

## TITLE SEARCH

The title to the property should be "searched" by a competent attorney or other qualified agency capable of performing this service. The search should reveal any legal claims against the property in the form of mortgages, judgments, liens, taxes, assessments, rights of heirs of previous owners, and similar items. It is possible to have a title guaranteed by insurance. If the cost of the title search

## SITE SELECTION

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to satisfy the guaranty insurance company is not too expensive to warrant the charge against an inexpensive property, a guaranteed title is highly desirable.

Any prudent loaning agency such as a bank will not loan money to you with your house and property as security unless the title has been searched by a competent attorney or other qualified agency performing such service and found satisfactory without legal claims against the property.

### DEED

A **deed** is a legal document which expresses the intention of the seller and the buyer as to the quantity and quality of the ownership that shall pass from one owner to another. To be valid, a deed should meet the following essential requirements:

1. It should be properly prepared in writing.
2. It should be made between the proper parties.
3. It should fully describe the property to be conveyed.
4. There should be consideration for the buyer and the seller.
5. There should be a proper and sufficient execution of the document; that is, it must be signed, sealed, attested, and acknowledged.
6. There should be a delivery and acceptance; the mere writing is not operative unless coupled with the delivery by one party and acceptance by the other.

As stated above, the deed should include the exact description of the land conveyed in the deed. This may be a surveyor's description or the proper identification of the land by lot, subdivision, town, county, and state.

Land in its legal significance includes not only the soil but everything that is firmly attached to the land, such as buildings, fences, trees, and also other rights such as easements. All these things pass in the deed unless the contrary is expressly written in the deed.

A **warranty deed** is the preferred form of deed for the buyer. The seller promises by issuing a warranty deed to guarantee and defend the title which he passes to the buyer. The usual covenants of the warranty deed are that (1) the seller warrants that he actually owns the land, and (2) there are no encumbrances, unsatisfied mortgages, easements, liens or other claims against it, (3) the seller and his heirs will defend the title against all legal claims made by other persons, and (4) the seller warrants quiet enjoyment of the property.

**Quitclaim deeds** make none of these valuable promises, but merely say that the seller steps out of the picture and the buyer takes the seller's rights for whatever they are worth. These rights may be worth much or little. Frauds are often perpetrated by quitclaim deeds conveyed by persons who have no interest in the particular piece of land.

In the event that the seller has little or no financial standing, the warranty deed may not be much better than the quitclaim deed. The old adage of "sue a beggar and catch a louse" would be applicable.

Title to land may be acquired by foreclosure proceedings. The sale is conducted at public auction by a sheriff or referee. A purchaser, before taking title,

will of course make the usual title search not only to determine whether the mortgage itself was valid lien, but also to determine whether all proceedings in the foreclosure suit have been regularly taken and all adverse interests cut off. This is certainly a case for securing the services of the most competent attorney you can find.

The title is not perfected until the buyer (recipient of the deed) has the deed recorded upon the registry of deeds for the county in which the land is situated.

As a prospective homeowner you should not be disheartened or discouraged into thinking that the problem of the site selection for a home is a complicated, ponderous ordeal. The object in bringing all these matters to your attention is to warn you against difficulties encountered by those who have taken too much for granted and who have not taken the time and effort to study the problem. It is true that the site selection is a serious problem, especially for one of moderate financial means. A wealthy man might readily spend more money for site development than he had anticipated. The person of limited means must plan more carefully.

Naturally, when in doubt or before making a final decision on a site, you will consult some qualified, trustworthy person experienced in the more detailed aspects of the problems of site selection and building. Many features of these problems are peculiar to the community in which you plan to locate. Some of the consultant advice you need may be gladly furnished without charge. For other consultant professional services you may have to pay a nominal fee. When you consider what you can save through acting on competent advice, the fee you may pay is certainly money well spent.

For advice on site selection and building there are available the architect and the engineer, the real estate broker, the lawyer, the banker, the builders, and the building-materials dealer, all of whom may be most helpful to you.

It is highly desirable to have the independent unbiased judgment of one or more of these persons before entering into an agreement to purchase. Obviously, it is preferable to get the advice from persons having no financial interest in the transaction.

# PLANNING

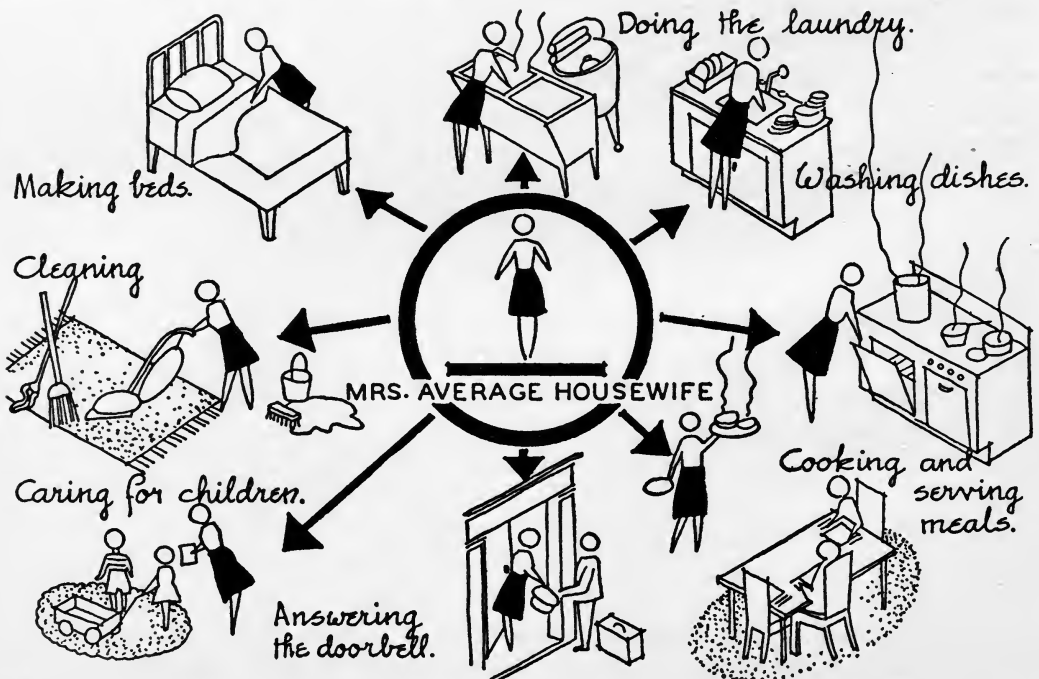
PRINCIPAL WORK AREAS—SPACE FOR RELAXATION—SLEEPING  
AREA—RELATION OF INDOOR TO OUTDOOR SPACE

**P**LANNING your home, determining its size and developing the plan arrangement can be undertaken only after a complete and thorough examination of your own family, its needs, interests, and activities. Your home and the use to which you put it should be a reflection of those who live in it. No two families' physical make-up, needs, interests, or activities are alike; consequently don't try to fit your family into a home merely because it meets the requirements of somebody else.

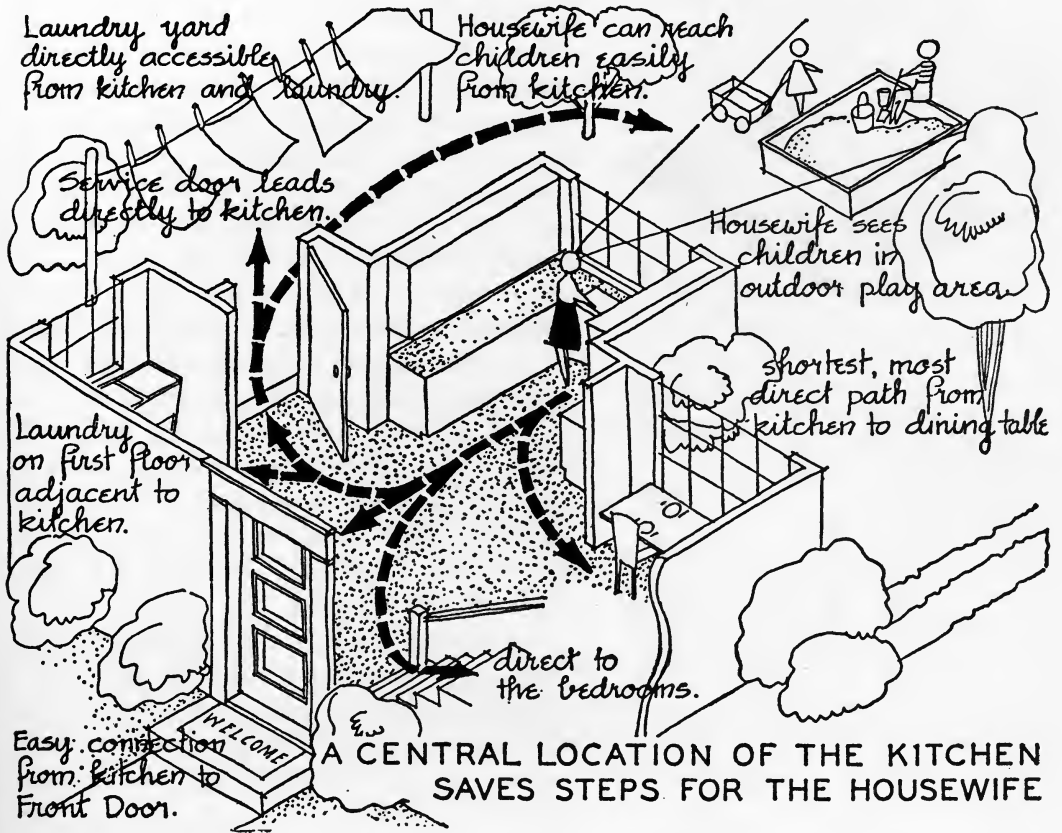
In general, the size of your family and the money you can afford to invest will determine the size and quality of the home you can build or buy. How the space should be distributed in your home is determined by the way you as a family live. So by all means plan your home to fit your family; don't remodel your family to fit your home.

## THE PRINCIPAL WORK AREAS

The housewife in the average family spends the greater part of her normal day performing household duties. These include cooking and serving meals, washing dishes, making beds, laundering, canning, cleaning, caring for children, and answering the telephone and doorbell, to mention but a few. Because of the complexity of the housewife's work, the first requisites of a well-planned home are cheerful and orderly work areas arranged for her convenience, to provide insofar as possible Freedom from Drudgery.

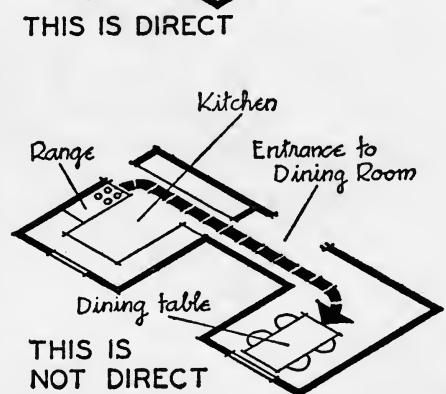
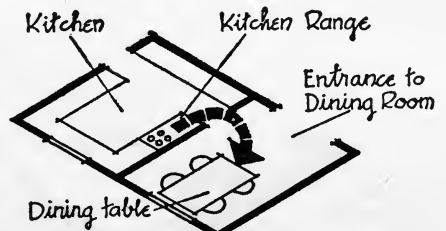


Most housework is done in or from the kitchen; hence the kitchen should be centrally located to save steps and unnecessary work.



The most important kitchen activities are the preparation, cooking, and serving of meals. To ensure that these activities go smoothly without needless interruptions, and to save the housewife steps, access from the kitchen to other areas in the home should be as direct as possible.

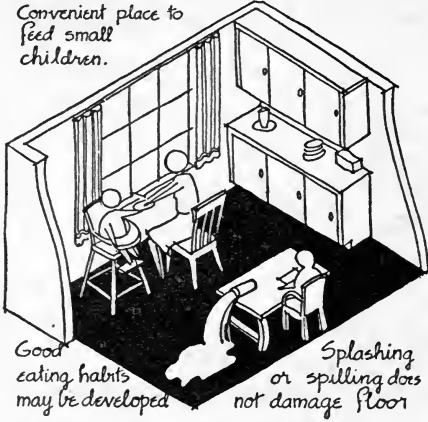
Dining space in your home depends on the needs and eating habits of your family. Whatever form it takes, and no matter where it is located—in the kitchen, in a formal dining room, or in a part of the living room—the actual distance from the kitchen serving area to the dining table should be short and direct. The housewife wastes time and energy if she must cross a hall or go through a long pantry to carry dishes to and from the dining area.



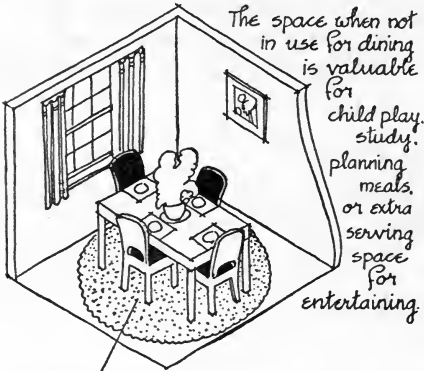


# PLANNING

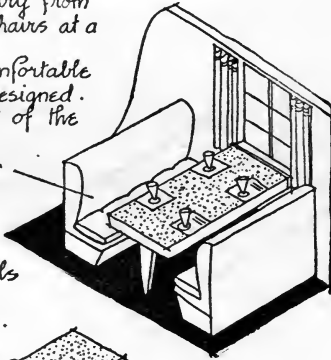
Convenient place to feed small children.



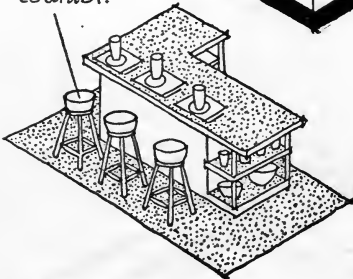
## DINING IN THE KITCHEN



The kitchen-dining space may vary from small chairs at a table, to a comfortable booth designed as part of the kitchen



or stools at a counter.



With step saving for the housewife as an objective, and good ventilation with exhaust fans a reality, a dining area in the kitchen for the modern home is not only possible but desirable. The kitchen-dining area saves the housewife many steps in serving and makes it convenient for her to clean up after meals, especially when there are small children in the family who must be supervised constantly while eating. Small children are often fed at times differing from the regular family meals. If the high chair or training table is located close by the general kitchen work area, the housewife can supervise the children's meals and still carry on with her own work. The children can learn good eating habits and splashing and spilling will not damage the floor covering and furniture.

The dining area in the kitchen may vary from small chairs at a table or stools at a counter to a comfortable alcove designed as an integral part of the kitchen. However, for best kitchen efficiency, the dining space should be located out of the path of the work area. The space should be well lighted and large enough not to cramp the eaters.

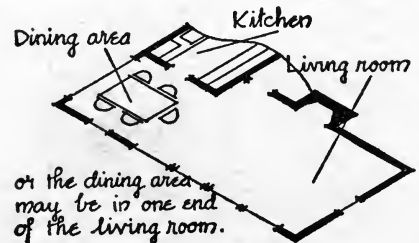
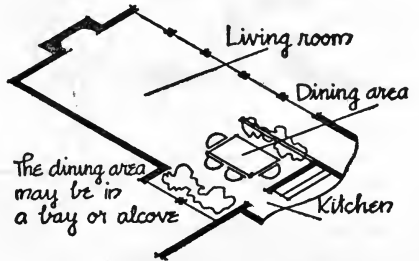
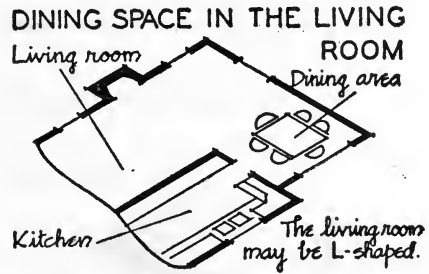
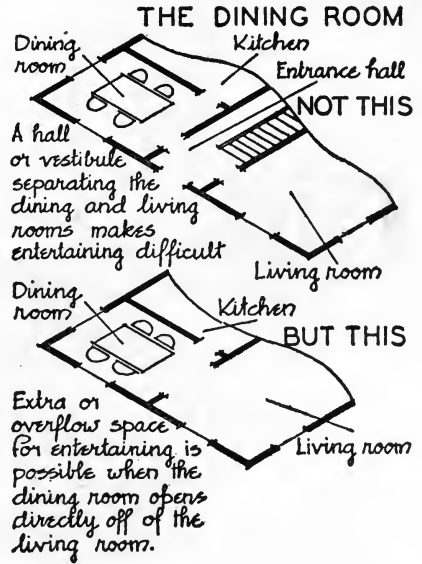
Kitchen dining also permits the convenience of quick breakfasts, part-time servants' meals, Sunday suppers, early pickup suppers, and midnight snacks. When not in use for dining, the extra space provided is valuable for other purposes such as planning meals, ordering provisions, sorting laundry, preparing for canning and freezing, and serving food for entertainment. On cold or wet days when outdoor play for children is impossible, the area under supervision of the housewife is especially convenient.

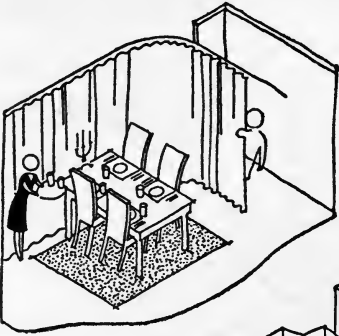


The separate dining room is generally more formal in arrangement and provides for family meals, small dinner parties, guest dining, and servant-served meals. A disadvantage of most separate dining rooms is insufficient floor area and wall space for furniture. Adequate space around the table for serving should be provided, and the wall area should be large enough to accommodate a serving table or chest. Good natural and artificial light are needed, and the framing of a pleasant view outdoors can contribute to making dining a pleasant occasion.

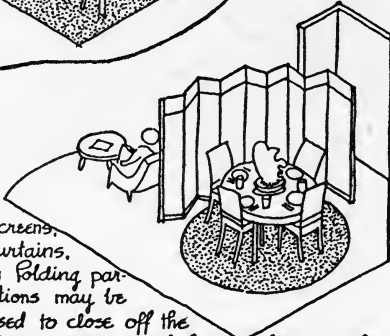
The separate dining room should open directly off the living room to provide at times extra or overflow space in the living room for entertaining. If the dining space is separated from the living room by a hall, vestibule, or other rooms, well coordinated entertaining is difficult, and people tend to get segregated into small groups.

Since the separate formal dining room is used so little during the day and it takes up so much useful floor space, it has been shifted in many modern homes to the living room. Combination living-dining rooms are a means of saving space and increasing the size and convenience of the living room, and many interesting arrangements and combinations of this type are possible. The living room could be L-shaped with the dining in the small leg of the L. The dining area could be placed in a pleasant, well-lighted alcove or bay window, or even in one end of the living room. In any event, the space provided when not in use for dining should add to the spaciousness of the living area.



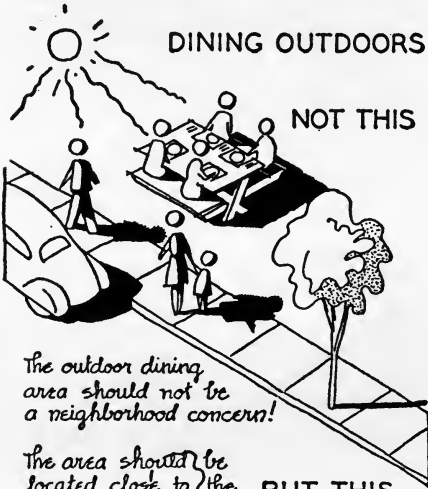


Screens, curtains, or folding partitions may be used to close off the dining area just before or after a meal.



## DINING OUTDOORS

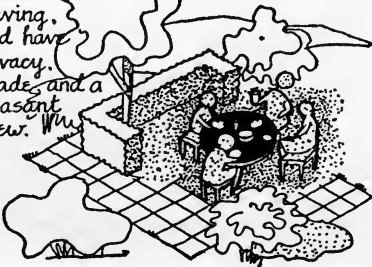
NOT THIS



The outdoor dining area should not be a neighborhood concern!

The area should be located close to the kitchen for serving, and have privacy, shade, and a pleasant view.

BUT THIS



Dining arrangements in the combination living-dining room are usually less formal, meals are more intimate, and the space when not used for dining is useful for other purposes. In the morning it might be used for children's play and in the evening for games, study, hobbies, or homework. The dining table should be so placed that it does not require moving when it is to be set for a meal, and again the shortest, most direct path from the kitchen to the table saves steps for the housewife.

When there are guests for dinner, there is a definite problem in setting the table and clearing away the dishes if these operations are in full view from the living room. This may be solved in part by the provision of curtains, a screen, or folding partitions which temporarily close off the view of the table.

During the warm months outdoor dining can be pleasant and a delightful change from indoor routine. The outdoor space could be a terrace, a screened or open porch where food may be served informally from the kitchen, or a landscaped area away from the house with picnic table, outdoor equipment, and a fireplace. The latter area should not be too far from the kitchen, for the greater this distance the more work it is to serve meals and the less it is likely to be used.

When your outdoor dining area is in full view of the neighborhood, dining ceases to be a family affair. To be really usable and enjoyable, the outdoor area should have privacy, shade, the benefit of cooling breezes, and if possible a pleasant view.

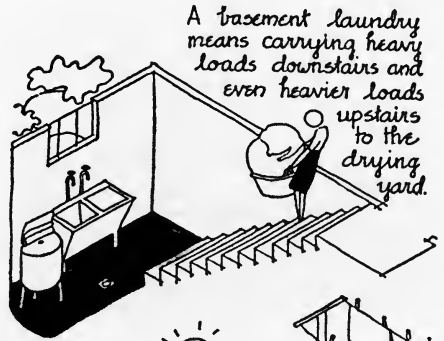
The basement laundry has proved to be a snare and a delusion to the housewife, who has to carry heavy loads of soiled clothes downstairs and then carry even heavier loads of wet clothes upstairs to the drying yard. Seldom are basements completely dry, light, well ventilated, and equipped with a door at grade leading directly out to the drying yard—conditions that would warrant locating a laundry there.

The laundry on the first floor convenient to the kitchen seems to offer many more advantages. There are no stairs to negotiate. Moreover, the housewife can carry on with kitchen duties between laundering operations, since laundering is not a continuous activity. A well-lighted, cheerful laundry area on the first floor is more healthful and certainly makes the drudgery of laundering easier to take.

The laundry, whether in the basement or on the first floor, should be directly accessible to an outdoor drying yard, which should have adequate sunshine during the day.

Cleaning is a household chore that does not necessarily diminish with a new home. However, there are conveniences that can lessen the burden to the housewife. A well-designed cleaning closet in or near the kitchen area is a necessity, and an auxiliary cleaning closet in the sleeping portion of the house saves steps and energy in carrying mops, brooms, and cleaning equipment. Electrical outlets should be so located as to allow the housewife to reach every corner with the vacuum cleaner. Resilient, waxable floors such as linoleum in the work areas are easy to clean. Simple, smooth moldings in woodwork do not have cracks in which dust and dirt will settle. Closets and work

## THE LAUNDRY



A well lighted laundry on the first floor is more healthful and saves the housewife extra work.

The drying yard should be close to the laundry, and have sunshine for as long a period as possible.

A well-designed cleaning closet is a Must!

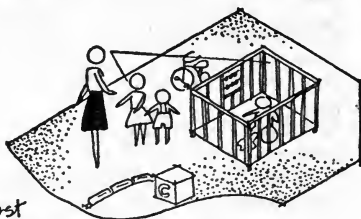
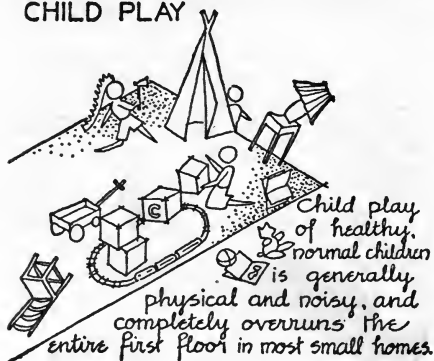
## CLEANING



Simple, smooth walls and mouldings are easy to wipe down and clean.

Elaborate mouldings collect dust and dirt, and are difficult to clean.

## CHILD PLAY



surfaces with smooth gloss or enamel-painted interior and exterior surfaces are easy to wipe down.

Children's play creates work problems for the housewife that more than double her regular duties and add to the complexity of housework, for children up to school age require almost constant supervision in their play.

Since the play of healthy, normal children is generally physical and noisy with emphasis on running, climbing, crawling, and hammering, it often completely overruns the entire first floor in a small home and becomes a family problem. Toys are always underfoot, furniture and decorations are damaged, and adult nerves jangled unless a suitable arrangement is possible. The ideal solution is to provide separate space within supervising distance of the kitchen. However, since play with supervision is not a permanent activity, it is common practice to make it share space with other activities on the first floor. Practical solutions are to confine such play to a kitchen-dining area, or to use the dining room or dining space in the living room when such places are not in use for eating. Arrangements for formal dining might have to be sacrificed during the years of supervised child play to insure a minimum of breakage and damage.

When the house is all on one floor and the child's bedroom is close enough to the kitchen for visual and physical supervision, most of the indoor play may be confined to that room. Supervision is impossible, of course, when the bedrooms occupy a second floor.

From the kitchen or laundry windows the housewife should be able to see the children playing outdoors and be able to reach them easily and quickly.

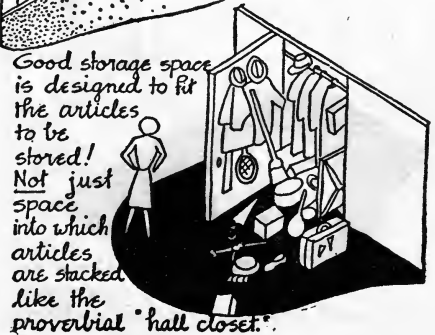
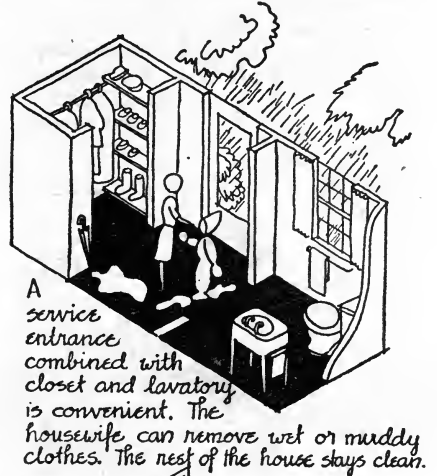
Child care as differentiated from child play involves the toileting, dressing, feeding, and sleeping of small children. Since the housewife must dress children for outdoor play, remove muddy shoes and wet clothes, and toilet the children when they come in from play, the task is simplified if there is an outside entrance with a toilet or lavatory and clothes closet handy to the kitchen. Then she does not have to leave the kitchen area and get the living portion of the house disordered and dirty. The lavatory close to the kitchen is convenient also for toileting children when playing indoors.

Even after children reach the age when play supervision is not necessary, such an arrangement of lavatory and closets makes a good entrance for them without bothering the rest of the household. The same entrance arrangement is convenient, too, for older members of the family who like to work in the garden or in the yard.

Storage, the putting away and getting out of articles used in the home, involves considerable work for the housewife. Storage of some kind is needed in connection with every activity in the house. The well-planned home has ample storage spaces located in exactly the right places.

Good storage space is space designed to fit the articles to be stored, and not just space into which the articles are stacked, like the proverbial hall closet where several things must be moved or shifted to get at any desired article.

To sum up, all work areas in the home should be carefully thought out to save the housewife unnecessary work and steps. Modern factory practice has given rise to the streamlining of production with emphasis on good lighting, convenience, and safety for the workers. The same emphasis on stream-

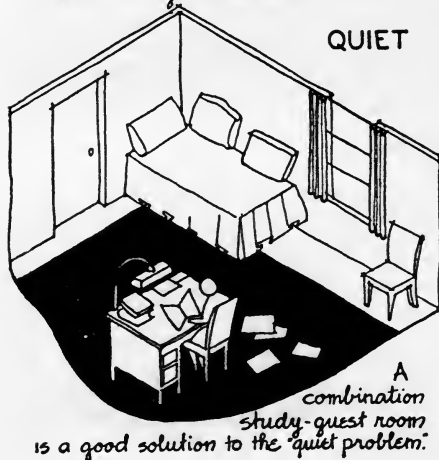


## RELAXATION



A flexible arrangement of rooms and space, makes possible the use of one room to serve many activities.

## QUIET



lining should be placed on work areas in the home!

## SPACE FOR RELAXATION

Concurrent with the rapid pace of modern living comes the need for relaxation and a change of scenery. Relaxation, taking many forms, requires space that does not conflict with normal household activities. Essential requirements of relaxation space are comfort, cheerful sunlit surroundings, and ample room for several persons to relax at one time.

Flexibility, meaning room arrangements that can be readily adapted to meet the changing needs of a family, is needed in the home so that a single room or area can accommodate more than one activity. In times past, family activities were limited to specific rooms, relaxation so-called was stiff and formal, and the "parlor" was the scene of entertainment when guests arrived. Today rooms serve for a great many overlapping activities. The living room, for example, in most small houses must accommodate various members of the family trying to study, converse, read the papers, or operate the radio simultaneously. Some of these overlapping activities can be absorbed in other places in the home if the areas are flexible enough to serve a dual purpose: the dining room or dining area, for example, the kitchen-dining area when not used for eating, or the bedrooms when not used for sleeping. Flexibility in the use of the various rooms means a better distribution of necessary family relaxation activities and makes for congenial family living.

Every household needs some area apart from the living room where one may find quiet, so necessary for reading, checking accounts, doing homework, or any sort of mental concentration.



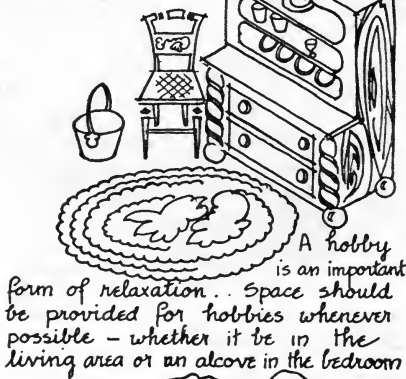
The combination guest room and study, or even a second living room that can be closed off from the rest of the house, offer a practical solution to the problem of quiet.

Entertainment of guests requires various kinds of space and covers a variety of activities, the accommodation of which taxes the ingenuity of the housewife. A completely flexible arrangement of the relaxation space can take care of entertainment ranging from a single bridge game to large parties or gatherings. There is no real problem involved in intimate entertainment such as a few tables of bridge, visiting, or afternoon tea. A slight rearrangement of the living-room furniture will accommodate this.

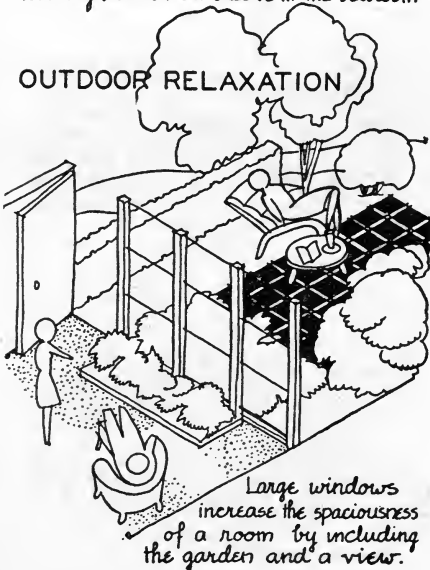
By combining the living and dining areas, a larger unified space is possible for accommodating large groups, such as bridge parties, games, buffet suppers, children's parties, or club luncheons. A hall separating the two areas makes a well-organized combination impossible.

A serious social problem exists when younger members of the family wish to entertain their friends without disrupting the rest of the household. Unless adequate space is provided, the older members of the family usually have to vacate the living room. The dining room, a separate basement or first-floor playroom, or the kitchen-dining space, if flexible enough in arrangement, is generally adequate for the younger people to entertain their friends. Expense permitting, the separate playroom or the second living room is the best solution. It saves living-room furniture, decoration, and rugs from accidents and also provides space for some forms of noisy adult recreation such as ping-pong and dancing.





## OUTDOOR RELAXATION



Hobbies of some sort, another form of relaxation, are enjoyed by most families. Hobbies may include such activities as stamp collecting, painting, carpentry, raising plants, photography, antique collecting, or playing piano duets. Some of these normally belong to the living area. Others, such as photography, flower raising, or carpentry, to mention but a few, require special equipment and space. Since hobbies add so much enjoyment to living, by all means try wherever possible to provide the necessary space for them, whether it be in a special studio or workshop, in the living room, the dining area, or even in an alcove of a bedroom.

Relaxing does not necessarily have to be confined to the indoors. Outdoor relaxation is becoming more and more an accepted part of our living, and most new homes are planned with an eye to incorporating the outdoors as part of the indoor relaxing space. The spaciousness of the living room may be enhanced or extended to include the garden and outdoors by means of large windows and doors opening directly onto a terrace or porch.

Modern outdoor relaxation, entertainment, and recreation preclude the use of the once-accepted front porch where the entire neighborhood became a part of the family group. Now the front porch has given way to a terrace, a porch, or a landscaped area that takes advantage of privacy, shade, cooling breezes, and a pleasant outlook. At least some part of the outdoor space may be under cover to afford protection from the elements for furniture which may be left outside during the entire season, and in some parts of the country not only cover but protection from insects is necessary.



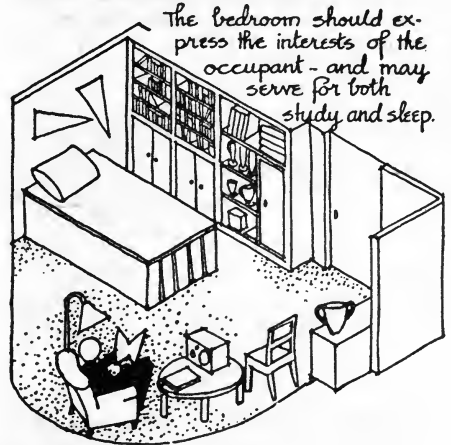
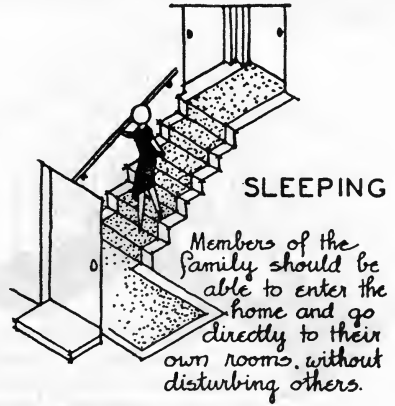
## THE SLEEPING AREA

Privacy and quiet are essential requirements of the sleeping area. You should be able to enter your home and go directly to your own bedroom without passing through that of another person. The bathroom should be accessible to all the bedrooms and to guests without disturbing the members of the family who have retired. No person should have to go from his own bedroom through that of another person or through the kitchen or living room to reach the bathroom.

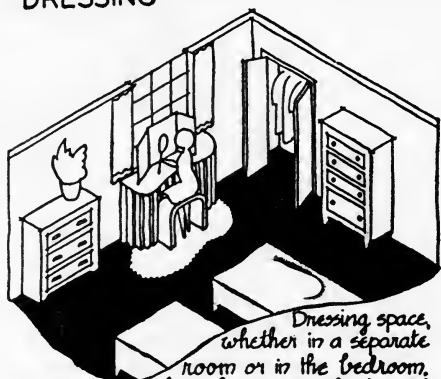
Today the bedroom has become increasingly important for many more uses than those of sleeping, dressing, and storage. The bedroom expresses the individuality of the occupant, serving him as an individual living room, study, hobby room, music or play room. The interests and activities of each member of the family should be analyzed so that his bedroom may be arranged to take care of his special needs. These may include space for a hobby collection, storage space for sports equipment, book shelves and reading area, a desk and study area, or play space and toy storage for small children.

Too often bedrooms are mere cubicles into which furniture must be squeezed, leaving no room for arrangement. There should be uninterrupted wall area or areas sufficient in length to allow placing the beds where there is adequate passage space for making them.

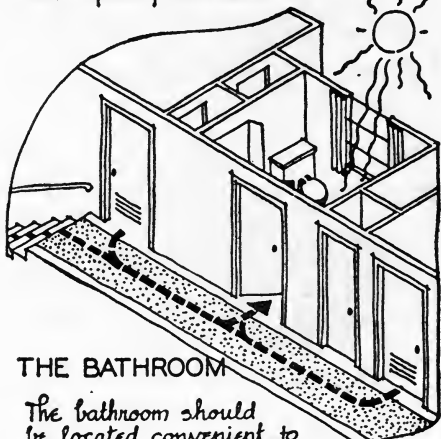
Sunshine and cross ventilation are desirable in the bedrooms. However, the beds should not be placed where the early morning sun glares directly into the sleeper's eyes, and the windows should be placed to catch the prevailing breezes without blasting the occupants out of bed.



## DRESSING



Dressing space, whether in a separate room or in the bedroom, is more usable with conveniently located storage, a dressing table, mirror, and space for chairs.



## THE BATHROOM

The bathroom should be located convenient to all bedrooms, and to the stairway or entrance to the sleeping area. For sanitary reasons, sunshine is desirable.



For the care of very small children, it is desirable to provide space for a bathinette and baby equipment.

Separate dressing space heated and closed off from the bedroom, making dressing in a cold bedroom unnecessary, is a luxury seldom found in small homes. However, dressing space, whether separate or in the bedroom, is more usable with adequate, conveniently located storage, a dressing table, full-length mirror, and space for chairs.

More freedom in arranging bedroom furniture and more space for dressing is possible with built-in storage equipment which eliminates the need for bulky dressers and chests. In older children's bedrooms a double-deck bed with built-in storage space beneath will save space, but it must be remembered that double-deck beds are difficult to make.

The bathroom should be convenient to all bedrooms and to the stairway or entrance to the sleeping area. Bathrooms should be compact for economy in plumbing, but not so small as to crowd any of the fixtures or their use. There are three kinds of bathrooms generally used: private, semiprivate, and family. Private bathrooms are designed for use by only one or two persons and are usually attached directly to a bed or dressing room. Semiprivate bathrooms serve three or four members of the family or guests and are located between adjoining bedrooms and a hall. Family bathrooms are used by the entire family and guests, and usually open only into a hall.

With the minimum space enlarged slightly, the bathroom might contain an area for dressing and possibly a dressing table. For very small children it is desirable to allow enough space for a bathinette, diaper pail, supplies of clean clothes, and a child's toilet seat. For sanitary reasons sunlight and ventilation are especially desirable in the bathroom.

### SERVICES

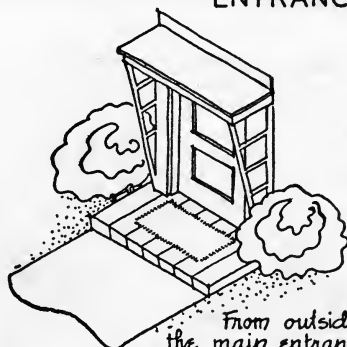
Service areas include storage arrangement, entrances, and provision for getting supplies into the home and taking out waste such as garbage, ashes, and refuse.

From outdoors the main entrance should be well defined and easy to locate. From the main entrance you should be able to go directly to the bedrooms and living room, and the housewife should have easy connection from the kitchen to save steps in answering the doorbell.

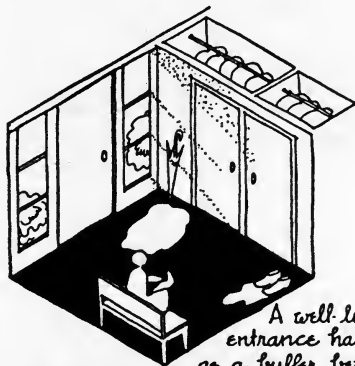
An ample, well-lighted entrance hall serves as a desirable buffer between the living room and the outdoors and also serves as a place to remove outdoor clothing, rubbers, and so on, especially in stormy weather. To keep dirt and water from tracking into the living room, a washable floor covering is necessary.

The entrance hall closed off from the living room prevents drafts, saves heat, and serves as a place to say good night to lingering guests. Although an entrance hall does not always seem necessary, it is easier to speed the parting guest from a hall that is separated and closed off than from a door opening directly outdoors from the living room.

With the increased use of the automobile for fulfilling daily transportation needs, location of the entrance may depend upon where you leave the car when you arrive. Some form of covered protection from the car to the house is desirable, especially in bad weather. The service entrance might be apart from the main entrance, since it is helpful after shopping with the car to unload groceries and supplies



*From outside, the main entrance should be well defined and easy to reach.*



*A well-lighted entrance hall serves as a buffer between the outdoors and the living room, saves heat, and provides a good place for removing outdoor clothing.*

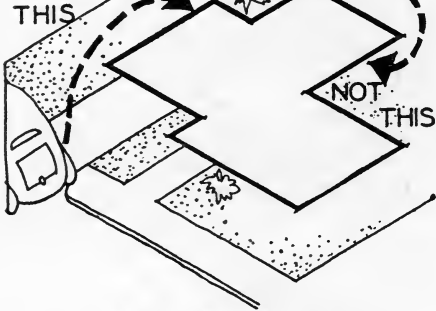


*Some form of covered protection from the car to the house is desirable.*

# PLANNING

## SERVICE

To insure privacy for indoor and outdoor living areas, the service entrance should be convenient to the street.

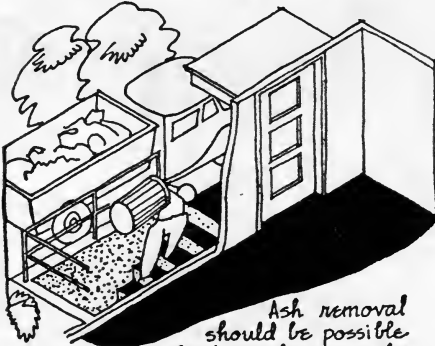


Coal delivery should be possible, without damaging lawns or shrubs.



Not more than 20 feet from the truck to the coal storage bin

Ash removal is dusty and dirty!



Ash removal should be possible without tracking up the kitchen work area.

directly into the work area and not have to carry them through the living area.

The service entrance, the place where the tradesmen will deliver their goods, should not be confused from outside with the main entrance. It should be located as conveniently as possible from the street, so that tradesmen do not have to carry their loads too far or cross outdoor living areas to reach it. For visual supervision by the housewife of goods coming in, the service entrance should lead directly into the kitchen work area. If conveniently located, the same entrance will be used by the children and part- or full-time servants.

Other services into the home which need at least direction, if not supervision by the housewife, are the delivery of coal and fuel oil. Fuel-oil delivery is a comparatively simple operation and coal delivery should be. The coal-storage area should not be more than twenty feet from truck to bin and should be located so that the coal truck can deliver from the street or from a driveway and not have to back across lawns or landscaped areas.

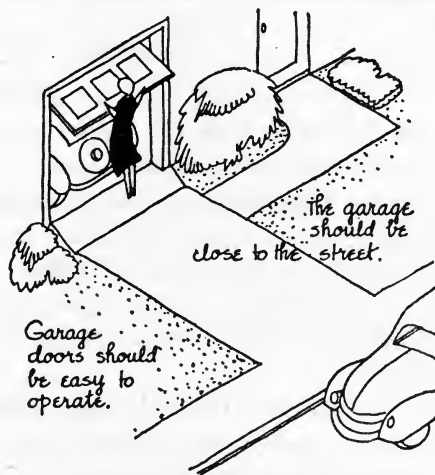
The same service entrance will be used for outgoing waste materials, garbage, paper, tin cans, ashes, etc. To keep the housewife dry when putting out garbage or trash, some form of cover or protection from the elements should be provided.

Ashes are always dusty and dirty and their removal should be effected, whether from a basement or first-floor heating room, without tracking up the kitchen work area. Where ash removal is a weekly or biweekly task, an outside areaway or covered stairway from the basement to the service entrance is desirable.

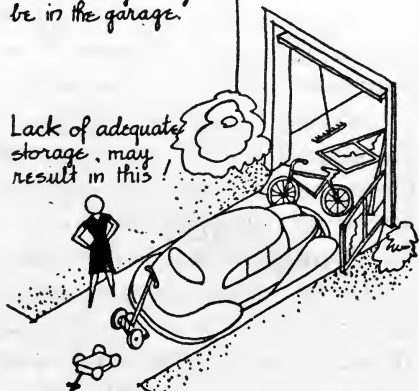
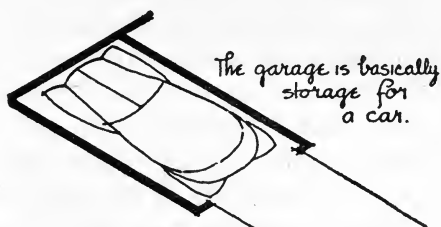
The garage location and use is open to debate. Originally the car was housed in the stable behind the house, and out of habit the first detached garages were built at the same place. Then the car was a fair-weather or Sunday-afternoon affair, and since it was generally stored in the winter months, shoveling snow out of the driveway for its use was not a problem. Now, however, with the car a necessity in all kinds of weather, both in summer and winter, the car and its garage should be located closer to the street. Such a location saves driveway-paving costs, means shorter distances to shovel in the winter, and furthermore leaves the area at the back of the house free for a garden, lawn, or outdoor living area.

The garage is basically storage area for the car which brings in with it dirt, grease, snow, and water. A well-drained floor that can be hosed out, and doors that operate easily, are a necessity. Since the garage is primarily for the car, any other activities or storage should be planned with care, so that the car will not knock down and smash things on the way in, or go out with fenders laden with bicycles, storm sash, toys, and garden tools.

By increasing the minimum floor size needed by the car, additional storage space may be added in the garage for the storing of garden tools, screens, storm sash, bicycles, and bulky playthings. If heat is provided, a laundry, a green house, or a workshop might easily become part of the garage.



THE GARAGE



## RELATION OF INDOOR TO OUTDOOR SPACE

Hard and fast rules for proper orientation of the home to obtain sunshine and air are at best only arbitrary, and usually the application of the rules results in a compromise. Sunshine and air should be governing factors, but orientation is also dependent on the geographical location, climate, the site in question, existing trees, a view, adjacent properties, the street, zoning restrictions, and the whims and wishes of the family.

You should analyze your own immediate requirements and apply the rules of sunshine and air to meet the needs of your site, the climate, and your family desires.

Sunshine in the living areas contributes to good health and happiness. However, until just recently the living room was conventionally located at the front of the house along with a front porch. It followed that the most desirable building lots were on the north side of the street where the living room would receive southern sun. Today the era of front porches is fading and more consideration is given to proper orientation for sunshine regardless of street location.

Summer sunshine is often hot and glaring. To orient the house for protection against the hot summer sun and yet take advantage of the warming winter sun might require the use of an overhanging projection or awnings to eliminate the summer sun higher in the heavens and still allow the winter sun to shine in. In addition to being healthful, especially in the living and child-play areas, the winter sun also effects substantial savings in heat costs.

Well-placed shade trees, covered porches, and a well-ventilated attic space will also help to eliminate the heat of the summer sun.

Sleeping rooms are pleasant when they receive the morning sun, but sunlight directly in the eyes of the sleepers is annoying.

Breakfast areas oriented to the east to receive the early morning sun can be cheerful the year round.

At sunset, especially in the summer, the dining room will be uncomfortable and subject to glare if it faces west or south. A southeastern exposure is preferable.

It is desirable in most sections of the country to take advantage of the cooling prevailing summer breezes. Porches, terraces, outdoor areas, living areas, and bedrooms should be oriented to receive these summer breezes.

Protection against the wind is necessary in some sections of the country that are subject to cold, piercing winter winds or even hot, parching summer winds. Protection by adjacent buildings, a windbreak of trees, and adequate use of insulating materials help to cut down the bad effects of undesirable winds.

Natural views such as distant mountains, a stream, a well-shaped tree, a garden or landscaped area add to the enjoyment of living if they are made part of the home. If you are fortunate enough to have a pleasant natural view, by all means orient your home or at least some part of it to take advantage of this. Relaxing becomes doubly enjoyable if the eye can take in the view outside the room, and the view in turn becomes an important part of the room. Too often the home turns its back on a view; it is planned merely to be attractive for the neighbors to look at from the outside. Of course your home should be attractive

on the outside, but its orientation to include views from the inside out is more important to your family's pleasure than its appearance on the outside to the neighbors.

The relation of your home to the street may be dictated by subdivision, zoning, or setback requirements. Most communities require that the houses be placed at a specified uniform distance from the street. The character of the street, whether it be a quiet neighborhood street or a busy thoroughfare with heavy traffic, will certainly determine what rooms should face the street or what precautions should be taken to protect the house from undesirable noises. In recent times at least, children's play areas, outdoor living areas, and a garden have been placed to the rear of the house to ensure safety and privacy.

Your own privacy should be protected, since in most communities you can never be certain who your neighbors may be, and, in places not completely built up, how future buildings on property adjacent to yours will affect your own home. Insure your privacy from your neighbors; do not locate rooms where their proper use will be impaired by buildings on adjacent properties; and protect outdoor living areas, porches, terraces, and landscaped areas by well-placed landscaping such as trees, shrubbery, and decorative fences.

Plan the home as a sound permanent investment. Good planning pays dividends in comfortable, healthful living for you and your family.



# PLAN ANALYSIS

LIVING ROOM—DINING ROOM—BEDROOM—KITCHEN—PLAN  
CRITICISM—PLANNING CHECK LIST

**W**HEN you search through magazines for examples of rooms for your new home, or when you look at a house already built with an idea to buying it, examine the plans carefully and critically for arrangement of rooms. Examine each room to see how your own furniture will fit.

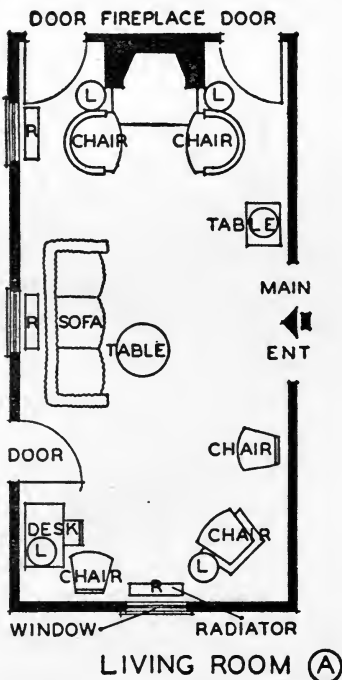
Don't be misled by gadgets or eye-catching selling points. They have their place in the selling lingo of houses and a great many so-called gadgets work well; but good planning comes not because of, but in spite of them.

The following plans show principal rooms with typical gadgets (selling points) that do not work well. In each case another room with approximately the same area and the same features is shown. Compare the two and notice why the second room works better. Learn to be critical of any plan you find.

## LIVING ROOM A

*Selling Point:* Fireplace.

*Criticism:* The room is poorly proportioned, too long for the width. Wall areas are cut up too much by openings, leaving insufficient space for furniture. The main entrance into the center of the room cuts the room in two, making a unified furniture grouping impossible. The radiator in the center of the long wall interferes with the sofa. The sofa in turn faces out to the entrance, instead of into the room. The fireplace is poorly located, with insufficient room around it for chairs. Doors at either side of the fireplace make a corridor around it. Traffic through the room from the main entrance to other doors cuts the space into small areas.





## LIVING ROOM B

*Criticism:* The room is better proportioned. Openings are better placed and doors near the corners of the room leave uninterrupted wall areas for long pieces of furniture. Radiators do not interfere with the furniture. There is sufficient space around the fireplace for chairs. The sofa becomes a part of a unified furniture grouping. The room has unity.

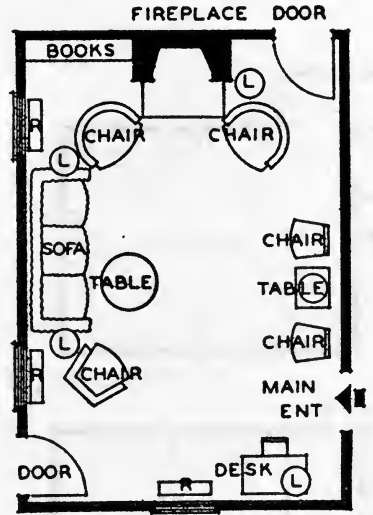
## DINING ROOM A

*Selling Points:* Corner cupboards and a built-in lighting fixture in the center of the room.

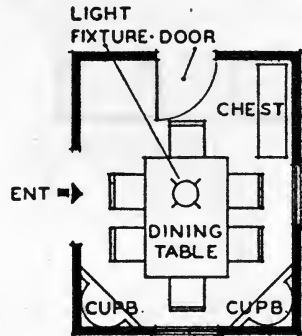
*Criticism:* The door from the kitchen interferes with furniture and disrupts the entire arrangement. A formal, balanced placing of table and chairs is impossible. The lighting fixture is not over the center of the table. No wall area is left for serving table or chest. There is inadequate space around the table for serving. Corner cupboards are not undesirable, but if there is no dish-storage space in the kitchen and dishes are stored in the dining room exclusively, the housewife must take many extra steps to set the table, take dishes to the kitchen for washing, and return them to the dining room for every meal.

## DINING ROOM B

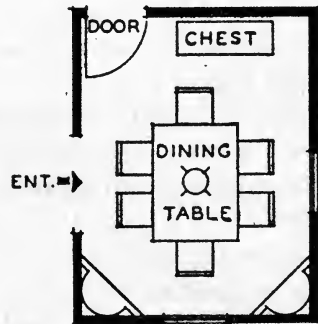
*Criticism:* Door from the kitchen opening into a corner does not interfere with the table and leaves ample wall space for a serving table or chest. A formal, balanced furniture arrangement is possible. The lighting fixture is well placed over the center of the table. There is adequate space around the table for serving and space to reach the corner cupboards.



LIVING ROOM (B)



DINING ROOM (A)

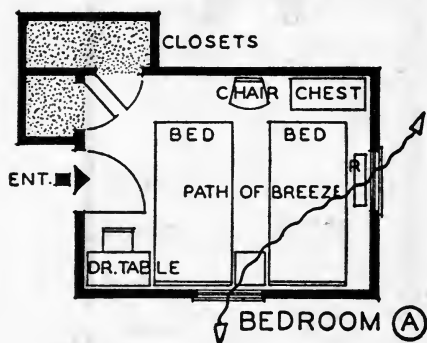


DINING ROOM (B)

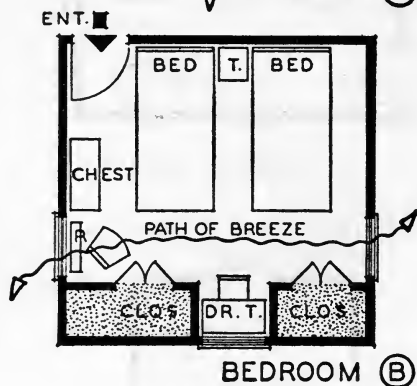
## BEDROOM A

*Selling Points:* Ample closet space and cross ventilation.

*Criticism:* Room is insufficient in size for the placing of beds and other furniture. One bed comes across a window. There is not enough space around the beds for making them. There is cross ventilation, but the arrangement of the windows causes down drafts on the beds. Closets are poorly placed; the doors when open interfere with each other and block traffic. The door from the hall closes off space for the dressing table. Dressing space is inadequate and poorly arranged.



BEDROOM A



BEDROOM B

## BEDROOM B

*Criticism:* There are adequate wall areas for beds and furniture and enough space around the beds for making them. Cross ventilation is good; air does not blow across the beds. The door from the hall opens into a corner and does not cut off usable space in the room. The dressing area is well arranged with adequate space around the closets. The dressing table is out of the line of traffic.

Before continuing with examples of kitchens, consider the various work areas normal to any kitchen. There are usually three areas, each centered about one of the three major pieces of kitchen equipment, namely, the refrigerator, the sink, and the range. Combined with each piece of equipment are work surfaces and storage space for articles needed in that particular place. The areas are arranged in a logical sequence from the service entrance, where food enters the home, to the door leading to the dining area where the prepared food is served.

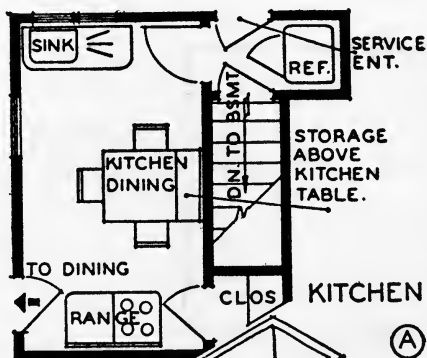
Adjacent to the service entrance is the food receiving, storage, and preparation area with the **refrigerator**; next the food cleaning and dishwashing area with the **sink**; and finally the food cooking and serving area with the **range**. When the three are arranged in the order named, work can proceed in an orderly, satisfactory manner with emphasis on convenience and time saving.

The size of your kitchen will vary of course according to the size and needs of your family. As long as the work areas are located in proper sequence, countless variations in arrangement are possible to suit individual desires and tastes, such as projecting the sink or range into the room to allow work to proceed from two or three sides.

## KITCHEN A

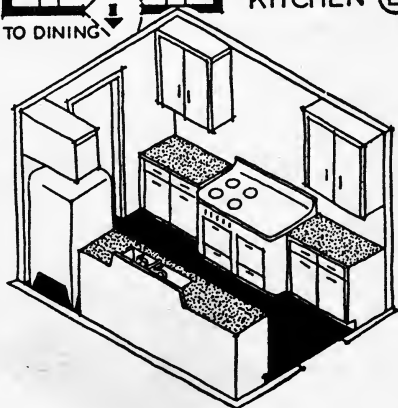
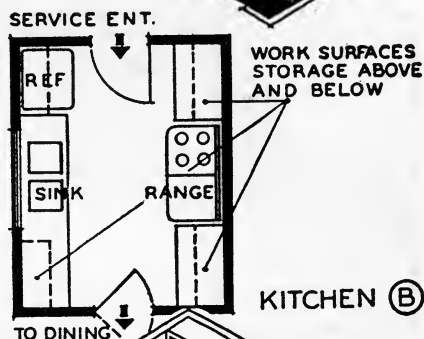
**Selling Points:** Eating area in kitchen, modern range, sink with window over it, and large storage closet.

**Criticism:** General arrangement is poor. The work of preparing and serving meals is difficult and awkward. The housewife would waste endless steps: first, getting food out of the refrigerator through a barrage of doors; next, preparing the food on the table, the only available work surface; washing food at a sink, pushed into a corner with no working area around it, and then finally cooking the food and serving it, with the range located between two doors that constantly interfere with it. The process is further complicated since the only storage space for pots, pans, cooking equipment and the like is in a corner near the range, and dish storage is in a wall cabinet difficult to reach over the kitchen table. True, there is a kitchen eating area, a modern range, a sink with a window over it, and a large storage closet, but the housewife using this kitchen could look forward to nothing but countless wasted steps and endless inconvenience.

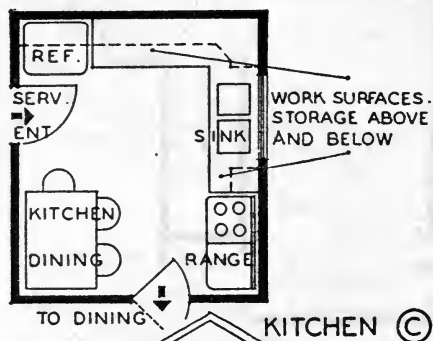


## KITCHEN B

**Example of a two-wall or Pullman-type kitchen.** Arrangement is compact, efficient, and suitable in homes with small families. Disadvantages are that doors at either end confine traffic to the passageway in the center needed for working, and the shape does not generally allow for a supplementary table for kitchen dining.

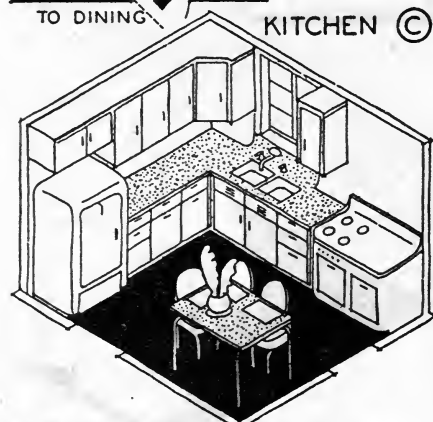


A workable variation of the plan, not illustrated, is one where the work areas are arranged along one wall. This type of kitchen is generally used in apartments or very small homes.



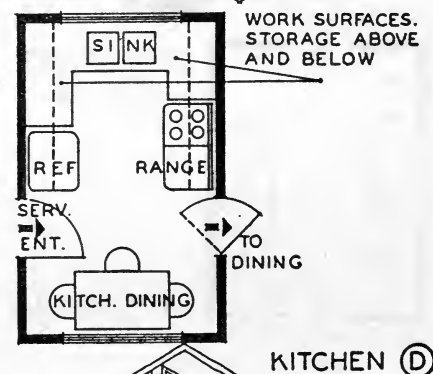
## KITCHEN C

*Example of an L-shaped kitchen.* Arrangement is compact and orderly. Work proceeds in good sequence from the service door to the dining area. Two walls not used for equipment are convenient for kitchen dining. The space between the work surfaces and the dining area should be sufficient so that traffic does not encroach on space needed for working.



## KITCHEN D

*Example of a U-shaped kitchen.* Arrangement is most compact and step saving, with the refrigerator, sink, and range close together. Doors in and out define traffic away from the work area. The U-shape is most economical for space and convenience. The kitchen-dining area does not interfere with kitchen activities.



It is entirely possible for an inexperienced person to combine a series of individual, well-designed rooms under a roof and call the combination a house plan; yet, more often than not, the result is a poor one. Although the design of individual rooms is important, of far greater importance to you is the combination of rooms to form an economical, workable plan.

Only through the skill of an experienced person are rooms combined to form a well-planned house, in which the relation and interrelation of rooms and space are economical, efficient, convenient and orderly throughout.

It is at this point that the architect's planning skill affects the dollar value of a house. His experience contributes not only to the selection of materials and their installation, but also to good planning, which is directly reflected in the probable resale value.

No one will deny that a well-planned house has a greater resale value than a poorly planned one. Yet a well-planned house costs no more to build.



## PLAN CRITICISM

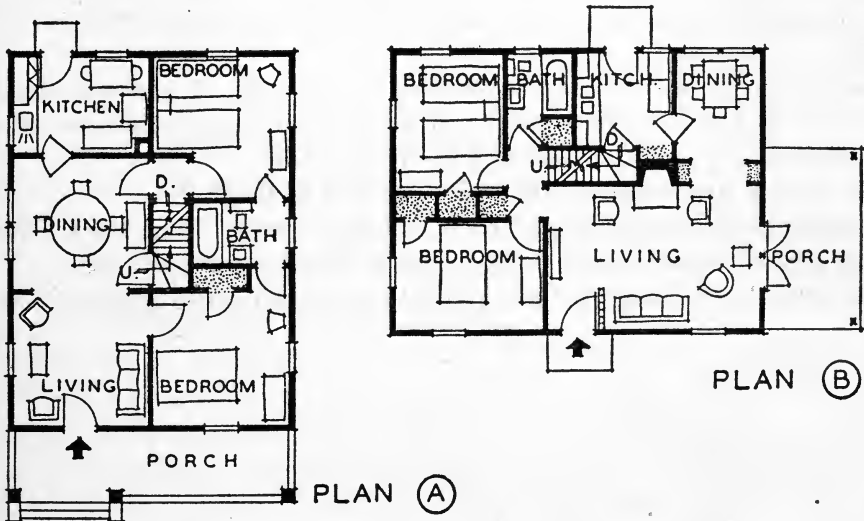
Shown on the following pages are some examples of houses that have already been built.

A sense of organization is lacking in some, while others express sound principles of sensible planning. In the discussion and analysis of the plans to follow, it must be understood that a valid criticism of any plan is impossible unless you know all the facts. You should know all about the family for whom the house was built, the site on which the building stands, and the conditions, both social and economic, under which the plan was developed.

Since all the facts and the families in question are unknown, the discussion must necessarily be abstract. Some of the points in question may appeal and apply to you, others may be dismissed.

When you analyze and criticize the plan for your home, be certain it fits the site and your pocketbook, and above all, fits your family!

Both plans illustrated on this page, Plan A and Plan B, are examples of minimum houses, the characteristics of which are simplicity of outline and structure, compactness and economy of equipment. To achieve these it is often necessary to eliminate some desirable features already described under Planning. For example, extra area in the kitchen for dining, child feeding, and child play; extra space in the bathroom for dressing and child care; or an extra study—guest room and lavatory have been sacrificed to keep the building size as small as possible. However, a minimum of house should not necessarily mean a minimum of living quality. The term should mean compactness and simplification of living space with emphasis still on convenience and orderly arrangement.



**Plan A Criticism:** The porch across the front and facing the street lacks privacy. Upon opening the front door a visitor could view the entire living and dining rooms and even see through into the kitchen. Thus the living areas lack privacy. The living room is too small and too cut up with openings to be a livable

room. Furniture arrangement is difficult. The dining room is cut up with too many doors; traffic would always make the room a thoroughfare. The kitchen is sufficient in size and convenient to the dining room for serving, but poorly arranged. There is an eating area, but other necessary equipment blocks its proper use. The bedrooms lack privacy because the doors to them open directly off the living room and the dining room. The bedroom adjacent to the kitchen has insufficient space for making the beds, and one bed comes across a window. The bath in itself is well arranged, but its relation to the bedrooms and other rooms is highly questionable. For privacy the occupants of either bedroom when using the bathroom would have to secure two doors. For guests to use the bathroom after members of the family have retired means going through a bedroom and disturbing the occupants. Storage space is entirely inadequate. The only closet in the entire house is in one bedroom where its proper use and efficiency at best are doubtful. The location of the stairs to the basement means carrying laundry, ashes, and waste through the dining room and kitchen to reach the service door.

**Plan B Criticism:** Same over-all size as Plan A, but a compact and workable plan. A view into the entire living area from the front door is impossible. The door swings against a screen, forming a vestibule.

The living room is larger and the space more usable for a better furniture arrangement around a fireplace as a center. The dining room, separated only by book or dish storage, becomes a part of the living room. The space of the two rooms combined is equal to that of the same elements in Plan A. Notice, however, that the area in Plan B appears more spacious. Traffic by-passes the dining table and does not interfere with it. The porch, opening off the living room where it can overlook a garden to the rear, is more usable.

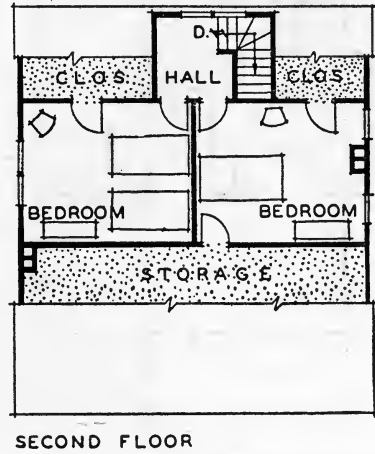
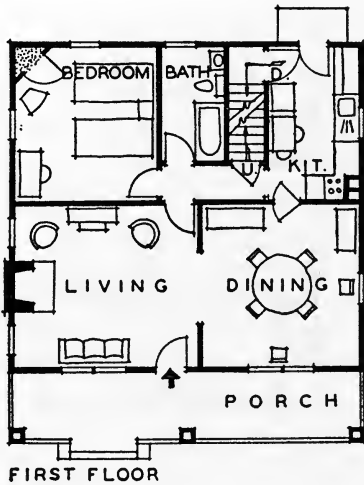
The kitchen, a variation of the two-wall type, is compact and orderly. The back-to-back arrangement of sink and bathroom is excellent for economy in plumbing.

The bedrooms, with the doors opening off a small hall and not directly out of major rooms, have complete privacy. It is easy to reach the bedrooms from the front entrance by crossing a corner of the living room.

The bath is convenient to the bedrooms and to the hall.

Storage space is more ample; each bedroom has its own closet. There is a closet for guests' coats in the hall and a linen closet in the bathroom.

The stairs to the basement are located conveniently to the service door.



PLAN C

**Plan C Criticism:** An example of a plan with a generous amount of space throughout, but lacking in a careful use of the space. The front door, without benefit of a vestibule, opens directly into the living room and, when the door is open in the hall, provides a view to the bathroom beyond.

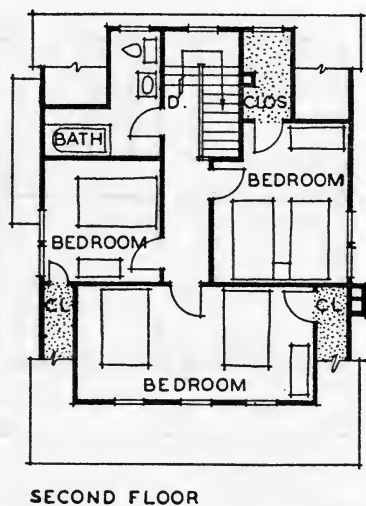
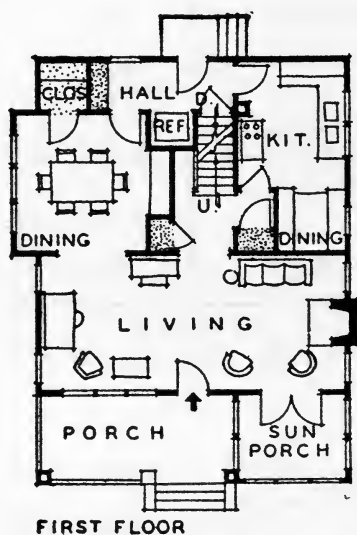
The dining room is far too large at the expense of the living room. Had the dining area been made smaller or combined with the living room, a more spacious living room would have resulted. The kitchen is adequate and serves directly to the dining room, and the stairs to the basement are convenient to the service door.

The arrangement of the bedrooms and bath is questionable. The bedroom, or study-guest room, on the first floor is convenient to the bath, but the occupants of the two bedrooms on the second floor must always use the stairs to reach the bath. A more workable solution would be to have a lavatory on the first floor and place the main bathroom on the second floor.

The bedrooms on the second floor are spacious, but cross ventilation is impossible. The chimney jutting into one room destroys usable wall area.

Storage space is sadly lacking throughout the house and the proper use of the available closets is questionable. The only storage space on the first floor is a poorly arranged corner closet, and the closets on the second floor, tucked back as they are under the sloping roof, are wasteful of space and hard to use.





PLAN (D)

**Plan D Criticism:** An example of a plan with three bedrooms and bath on the second floor with the added features of a breakfast room and sun porch on the first floor.

The front door again opens directly into the living room, and the front door plus the others to the dining room, the stair hall, and the sun room, so cut up the living room that usable wall area is at a premium. Traffic cuts the room into small isolated areas, and a good furniture grouping is impossible.

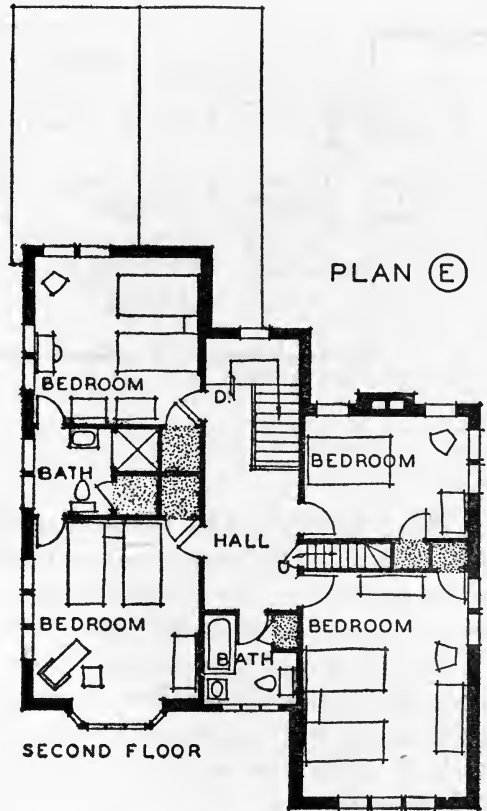
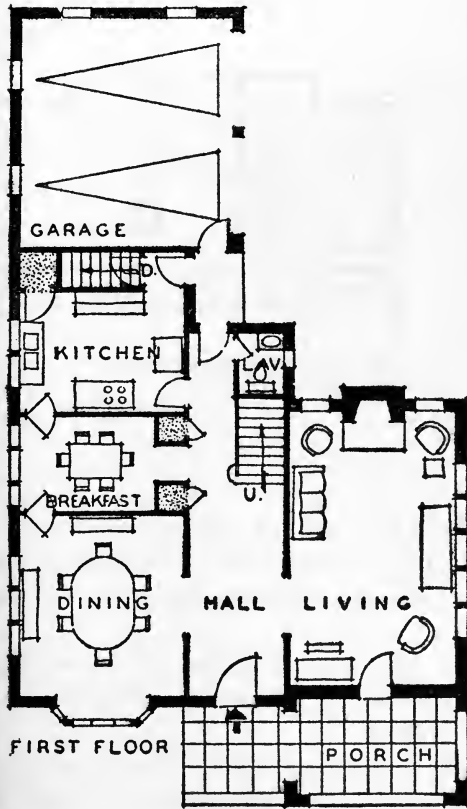
The kitchen is apparently large enough, but its use would involve endless wasted steps, since the refrigerator is located in a rear entrance hall, and serving to the dining room involves a tortuous trip through two doors, the entrance hall, and the pantry.

The rear entrance hall and the stair hall are wasteful of space.

Upstairs the bedrooms are ample in size but none have cross ventilation. The bedroom at the front of the house is cut in two by the entrance door. The bath is very awkward in shape. Although sufficient in area, it is too much cut up for convenience.

Storage space on the first floor is at least evident and the closets, although small, are usable. Second-floor storage is inadequate and the closets poorly designed. It is practically impossible to hang clothes in a long narrow closet sloping down under the roof.





**Plan E Criticism:** This plan is shown as an example of a house costly to build and costly to operate efficiently without servants. The outline of the house does not suggest economy in construction, irregular and cut up as it is. The large entrance hall makes real heating problems.

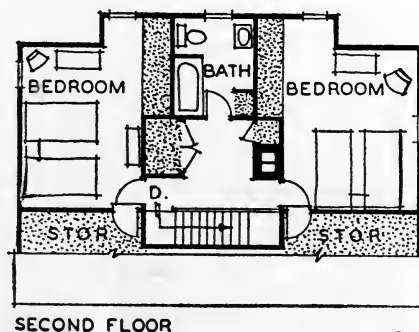
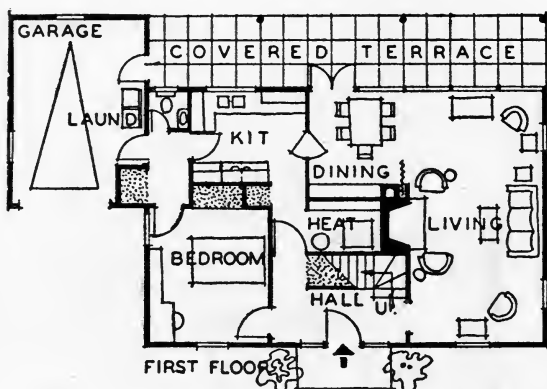
The kitchen, although ample in size, is wasteful of steps. Serving to the dining room means always going through the breakfast room, suggesting again servant-served meals.

All the bedrooms are spacious, each with cross ventilation and convenient access to a bathroom.

Storage space, on both the first and second floors, is entirely inadequate for a house this size. Bedroom closets are small and, in two cases at least, are confined in use by the entrance doors.

If this house were built on a confined lot, the living areas would lack privacy since most of the windows face to the side of the house.

The living and dining rooms would be better arranged if they could open into a garden to the rear of the lot rather than face the front.



PLAN (F)

**Plan F Criticism:** This house is an example of a compact workable plan on two floors with three bedrooms and no basement. The heating room and laundry are on the first floor. The front entrance opens into a generous stair hall. Closet space for guests is provided under the stairs.

The combined living-dining room opens onto a covered terrace across the entire back of the house. The use of large windows and French doors makes the garden at the rear a part of the inside living space.

The kitchen is compact and well planned, although there is no auxiliary kitchen eating space. Serving to the dining area and to the outside terrace is easy and direct. Built-in storage space in the dining area precludes the need for any sideboard or chest. The housewife can reach the front door easily from the kitchen without going through other rooms and she can conveniently supervise child play on the terrace outside the kitchen.

The extra bedroom, guest room, or study on the first floor is convenient for use by guests, and located adjacent to the kitchen is well placed as an isolation room in case of sickness.

The arrangement of lavatory and closets adjacent to the garage is handy for children, and the lavatory serves also as an extra bath when the first-floor room is used by guests.

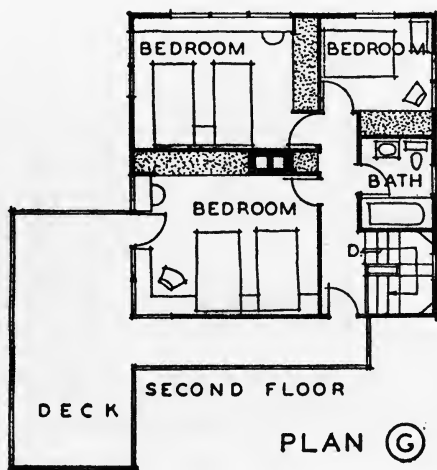
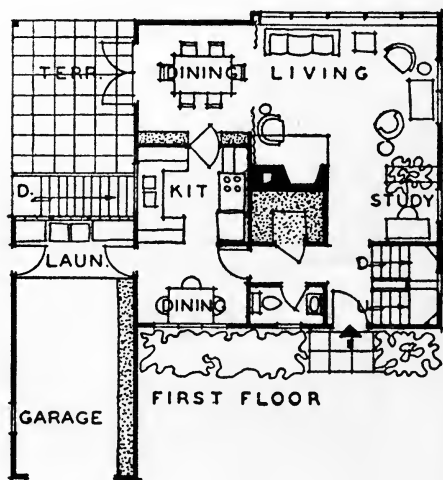
The laundry in the garage on the first floor adjacent to the kitchen will save the housewife steps and work.

The garage entrance into the house is convenient for taking in groceries or getting into the house from the car in bad weather.

Upstairs are two generous bedrooms facing out to the garden, and each has good cross ventilation.

The bathroom has space convenient for children's bath equipment. The closets or wardrobes against the two long walls make a good noise buffer for the bedrooms.

Storage space throughout the house is ample and conveniently placed.



**Plan G Criticism:** An example of a compact house, economical to build and operate. The house has many desirable features for step saving and convenience.

The front door opens into a generous stair hall, with a lavatory and coat closet near by. Just inside the living room is a quiet area, separated from the living room by a screen or cabinet. This area may substitute for a study-guest room.

The living room combined with the dining room faces to the rear, with large windows across the back. The dining area opens out onto a terrace at the rear of the garage.

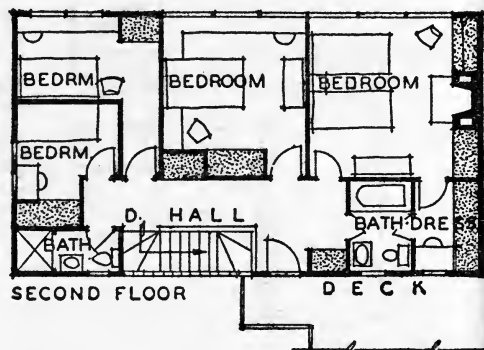
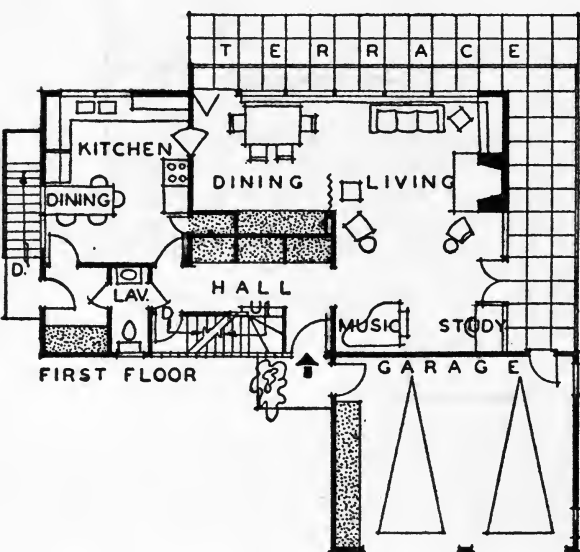
The kitchen is a variation of the U-shaped plan, well arranged, and serving is direct to the dining table, to a kitchen-dining area, or to the outdoors. The front door is easy to reach for answering the doorbell. The kitchen eating space is well placed for indoor child play or child feeding. The terrace is well arranged for an outdoor play area under cover, both within easy supervising distance from the kitchen or the laundry.

The laundry occupies one end of the garage, convenient to the kitchen and an outdoor drying yard. The service entrance through the laundry is direct and handy to the lavatory and closet for children or grownups playing or working outside.

Heating in this plan is located in a basement but with the use of oil or gas could be placed in part of the space used by the front-hall closet.

Upstairs the bedrooms are spacious and well arranged for cross ventilation. The ample storage space in each bedroom makes a good barrier between adjacent rooms.

An outdoor deck or terrace over the garage is available for sun bathing or airing clothes and bedding.



PLAN (H)

**Plan H Criticism:** An example of a larger house with four bedrooms and a two-car garage, again compact and economical to build. The entrance hall is generous and has the convenience of a lavatory and ample closet space.

The combined living and dining room opens to the rear and is enclosed outside by a living terrace partly covered and protected at the front by the garage. A study or music area is suggested at the entrance to the living room.

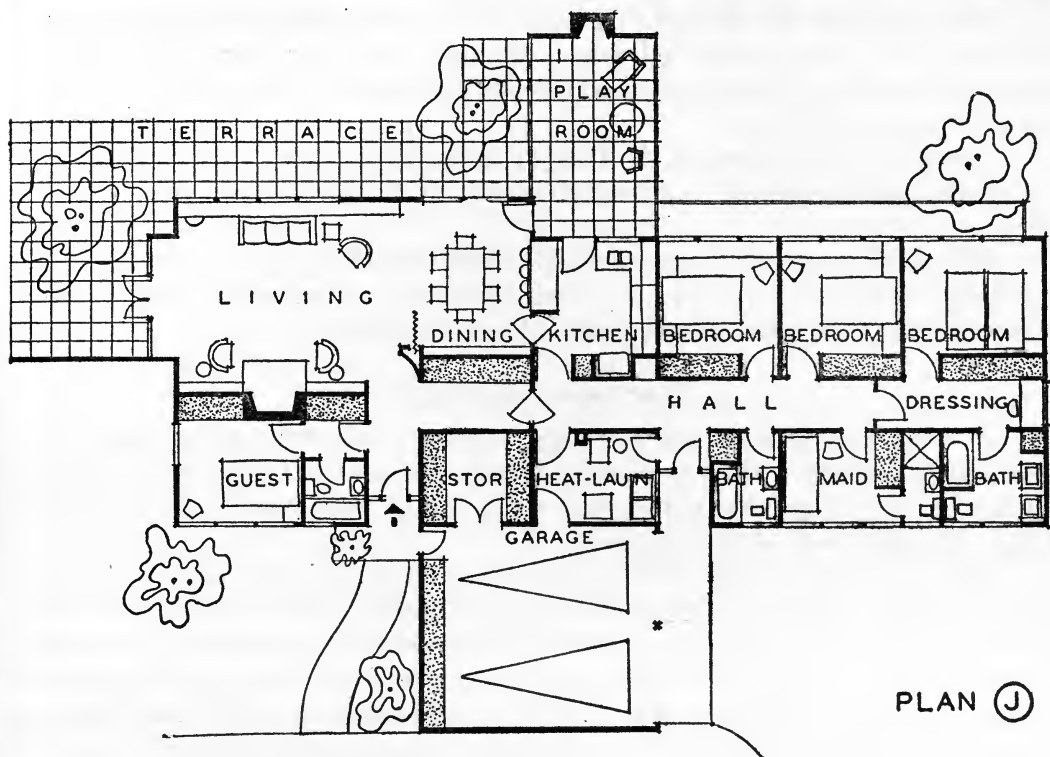
The kitchen, a variation of the L-shape, is convenient and orderly, with a kitchen-dining space consisting of stools at a counter.

The service entrance, with an outside stair to the laundry and heat in the basement, is accessible to a lavatory and closet.

Upstairs the master bedroom has a fireplace and a separate dressing room and bath. The two small bedrooms at the end of the stair hall, with the adjacent shower room, suggest their use as a suite by two boys or two girls.

Storage space is ample and well placed.

A deck or terrace is possible over the garage, and on the first floor the terrace is extended over the windows in the living-dining room for protection of the large windows.



PLAN J

**Plan J Criticism:** An example of an extended-plan house built all on one floor with all the principal rooms facing out to the rear to a garden or a view. Because of land use and lot sizes in most cities, such a house would be impractical except in a country location or development where land is not confined or restricted. Without servants or help, the smooth operation of such a house would be an impossibility for the average housewife.

The front entrance, connected closely with the garage, opens into a large hall. Adjacent is a guest room or study with bath and storage. A continuation of the hall forms the nucleus of the bedroom wing and connects through to the service entrance, the kitchen, laundry, and heating room.

The living room is spacious, with an outside living terrace protected for privacy by a wall extending out from the living room. The dining room, at one end of the living room, can be closed off by a curtain or combined with the living room for greater space.

A first-floor room or glassed-in porch opening off the kitchen makes an ideal spot for children to play, supervised from either the kitchen or the living room. In warm weather children could be served their meals in this room and the space, connected as it is with the dining area, could serve as an adult game room in the evenings.

The kitchen, a modified U-shape, serves well to the dining and living rooms, to the porch and terrace, and to a breakfast bar in the dining area. It is a short distance to either the front or service entrances, and the laundry and heat are placed near by just across the hall.

# PLAN ANALYSIS

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The bedrooms are located to get the same orientation as the living areas. The entrance to the master bedroom is through a dressing room, off which is a large private bath with the added convenience of double washbowls for speeding up the morning ablutions.

Storage space, sometimes lacking in a one-story plan, is ample and well distributed. Off the garage is a large storage room for garden equipment and the like.

This plan, a good example of recent thought on home planning, shows the conscious attempt to organize all major rooms in a scheme that acknowledges orientation for sunshine, privacy and a pleasant outlook.

## PLANNING CHECK LIST

Whether you plan to build or buy a home, remember that a home often represents the largest, most permanent investment in the lifetime of the average family. Examine carefully and choose wisely; make sure that the space you are buying fits the needs of your family.

When you buy a home already built, first reexamine your family's requirements, making sure that the prospective home fulfills their demands. To ensure that the rooms in the house in question will accommodate the furniture and rugs you own or hope to buy, it is suggested that you measure each room and make a diagram or sketch of the rooms to a scale. A convenient, workable scale or size is  $\frac{1}{4}$  or  $\frac{1}{2}$  in. equals 1 ft. The plan can be drawn on cross-squared paper. Show on the diagram the location of windows and doors, heat registers, radiators, and light outlets, and indicate the swing or path of the doors when they open. If you place on the room diagram cutout pieces of cardboard representing your furniture and rugs (the cardboard cutouts drawn to the same scale as the room diagram), you can determine if the room is useable for your needs.

When you build a new home, again examine your family's requirements and bring to your architect helpful and useful information about your family that will enable him to plan a home expressive of them, their needs, and activities.

The following information is provided as a check list for your convenience. Use it when you intend to buy a house already built, or when you plan to build your own home.

## LIVING ROOM

**Living room well proportioned**, length to width. A long narrow room is hard to furnish and appears to be a corridor.

**Wall areas large enough** to accommodate large pieces of furniture. Remember a sofa is approximately 6 ft. long, an upright piano is 5 ft. long, and a grand piano  $5\frac{1}{2}$  to  $6\frac{1}{2}$  ft. long.

**Windows well placed** for ventilation, reading, writing, or conversation. A window and an electrical outlet conveniently near every probable reading spot.

**Wall areas not cut up** by too many openings. Doors best placed near corners, so that they do not destroy wall areas useful for furniture.

**Heating registers, radiators, and electrical outlets** located where they will not interfere with furniture. These utilities best located near the ends of large

wall areas or under windows; not behind chairs, sofa, chests, or other furniture.

**Fireplace** well located. Out of normal traffic. At least 3 ft. either side of fireplace for chair grouping.

**Ash dump** in fireplace. Ashes drop from fireplace to cleanout in basement. No ash dump means carrying out ashes through the living room.

**Circulation** through the living room direct, to take up as little floor space as possible. Circulation is the amount of space needed to go from one part of the house to another.

**Coat closet, stairway** to sleeping area, and bathroom well located. Best not to cross entire living room from front door to reach any of these.

**Front door** well located. Housewife should not have to cross entire living room to answer doorbell.

**Necessary furniture groups** not blocking traffic. Normal circulation or traffic through the living room should be easy, not a hazard.

**Privacy.** Neighbors should not be able to look directly into the living room. Entire living room not visible from the front door.

**Noises.** Living room separated from bathroom and kitchen noises. Have another member of the family flush the toilet. Notice whether noise is audible and objectionable in living room.

**Furniture.** Living room will accommodate your furniture and rugs.

## DINING ROOM OR DINING AREA

**Access** from kitchen serving area to dining table short and direct.

**Size** adequate for **your furniture**. Space around table and chairs for serving. Wall areas large enough for buffet, chest, or serving table.

**Windows** well arranged for light and ventilation, not placed where they cut up wall areas needed for furniture.

**Doors.** Door from kitchen not interfering with persons at table.

**View into kitchen.** Door from kitchen, when open, not giving persons at table view of entire kitchen working area.

## BEDROOM

**Wall areas** large enough to accommodate bed or beds, dresser, chest of drawers, dressing table and mirrors.

**Doors** located to open back against wall, not to interfere with furniture, beds, or other doors.

**Windows** located to afford good natural light and cross ventilation. Not placed where they destroy wall areas needed for furniture or to cause down drafts on the beds.

**Radiators, heat registers, electrical outlets** not located behind furniture.

**Floor area** adequate for **your furniture**. Space around beds for making. Space for dressing convenient to clothes closets, chest, dresser, and dressing table. Space for straight chairs for dressing. Space for special furniture—chaise longue, easy chair, desk, hobby collection, children's toys, etc.



## PLAN ANALYSIS

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**Bath** located conveniently near bedroom. Persons should not have to pass stairway to reach bath.

**Bathroom noises.** Bath insulated from bedrooms; flushing toilet, running a bath should not disturb sleepers.

**Light switch** in hall outside bedroom door for safety at night. Many accidents happen at night when people fall downstairs because of inadequate light in the hall.

### BATHROOM

**Location** convenient to all bedrooms and to stairway, not placed where fixtures are visible from living room or front hall when bathroom door is open.

**Bathroom noises** not audible in bedrooms. Closets placed between bathroom and bedrooms for sound insulation.

**Fixtures** placed for convenience, enough clearance around them for proper use.

**Windows** for ample daylight and sunshine, preferably not over the tub where a window causes cold draft down on tub, is difficult to open and close, introduces the danger of slipping in tub to get at window. Tub best on inside wall.

**Floor space** ample for dressing.

**Walls and floor** smooth and sanitary for easy cleaning.

**Storage** of toilet equipment, cleaning etc. in addition to medicine closet, space for waste basket, clothes hamper.

**Children.** Space for bathinette, diaper pail, etc. Bathinette preferably not in tub where it has to be lifted in and out to use tub.

**Water shut-off valves** on all fixtures, located conveniently for plumbing and maintenance repair.

**Accessories.** Adequate towel racks, paper holder, grab bar or rail in tub or shower.

### HALL AND STAIRS

**Hall and stairs and stair landings** well lighted for safety.

**Light switches** at head and foot of stairs.

**Handrail** on main stairway and basement stairway.

**Stairs** not too narrow or steep for safety.

**Outside stairs** well lighted, protected from weather, equipped with handrail.

### KITCHEN

**Modern,** efficient arrangement to save steps.

**Lighting.** Good natural and artificial light at all work centers. Adequate electrical outlets for mixer, toaster, percolator, grill, etc.

**Walls and ceiling** smooth, gloss or enamel paint for easy cleaning.

**Floor.** Linoleum, cork or composition; nonslippery, nonabsorbent, durable, easy to clean, not tiring to walk on.

**Work surfaces** or counter top of material easy to clean, able to withstand pounding, cutting, and continuous cleaning.



**Height of work surfaces** convenient for housewife; try height of counter and your own height in relation to bottom of sink, to preclude unnecessary and painful bending. Toe space under cabinets.

**Ventilation.** Built-in fan, or windows, conveniently placed and easy to open.

**Refrigerator and range.** Measure your own refrigerator and range; make sure they will fit the spaces provided for them.

**Arrangement.** Work areas arranged in sequence from service entrance to dining room in following order:

1. Food receiving—storage, preparation—**refrigerator**.
2. Sink and dishwashing—**sink**.
3. Food cooking and serving—**range**.

## STORAGE

Every family's storage needs are individual; review your own needs, then check off the articles you must store and be certain there is a place in your home for everything you want to store.

Well-designed storage areas are placed conveniently near where the articles should be stored to save steps, promote safety, and avoid confusion.

**Basement storage** possible if basement is dry, light, and well ventilated; safe stairs.

**Attic storage** space should have safe direct stairs and convenient light switches for safety.

**Lighting**—adequate daylight and artificial light, good ventilation in storage closets.

**Kitchen Area storage** not necessarily in the kitchen, but close at hand near the kitchen:

**Food surplus**—canned goods, jellies, jams, fruit, root vegetables.

**Seasonal** (large equipment)—pressure cooker, canning kettles, canning jars, rubbers, caps, crocks, freezing containers, flower-arrangement equipment.

**Waste**—garbage, tin cans, newspapers, magazines, boxes, wastepaper, paper bags.

**Dining**—silver, dishes, table linen, special dishes, large bowls, platters, tureens, decorative dishes, stem goblets.

**Laundry**—soap powder, clothespins, laundry basket, soiled-clothes hamper, stocking- and glove-drying forms, small rack for drying standards, ironing board, sleeve board, ironing machine (mangle).

**Cleaning**—closet for brooms, mops, pail, dust cloths, cleaning and polishing solutions, vacuum cleaner and attachments, dustpan and brush, radiator brush.

**Children's play**—toy storage—may be a large basket, toy box, closet, chest, or shelves located near where the child plays. If space is provided, the child may be taught to put things away.

**Child care**—high chair, training table, child's toilet, crib, bassinette, scales, play pen, infant's feeding equipment—nursing bottles, sterilizer, etc.

**Home maintenance**—stepladder, large ladder, paints, brushes, tools, workbench, fireplace wood.

# PLAN ANALYSIS

## Living Area storage

**Main entrance**—clothes closet for street clothes, umbrellas, rubbers, rain-coats; guest closet for clothes (may be combined with family clothes closet or located adjacent).

**Minor or service entrance** —clothes closet for children's clothes, rubbers, snow suits, overshoes, closet or space for outdoor toys (taken in every evening), tricycles, wagon, sled, etc.

**Living room**—books, radio, writing equipment, phonograph records, musical instruments, sheet music, card tables, games, current newspapers and magazines, ash trays, special hobbies carried on in living room (moving-picture projector, screen, etc.).

## Sleeping Area storage

**Bedrooms**—clothes closets for summer and winter clothes, hobby or special articles, books, radio.

**Children's bedrooms**—clothes closets with moveable hooks and shelves, arranged in heights commensurate with child's age, hobby storage, sports equipment, toys and books.

**Bathroom**—linen, medicines, hot-water bottle, soap, toilet paper, clothes hamper, wastebasket. For children: bathinette, child's toilet seat, diaper pail, baby oil and bath preparations, infant's and young children's sleeping garments.

**General**—blankets, linen, towels, extra pillows, sickroom equipment—bed tray, back rest etc., bathroom-cleaning equipment.

## General Storage

**Seasonal**—trunks, suitcases, Christmas-tree decorations, sewing machine, baby carriage and stroller, bicycles, skis, skates, toboggan, sled, camping and picnic equipment, outdoor furniture, screens, storm sash and doors, unused furniture and pictures.

**Garage**—When looking at a house to buy, drive your own car into the garage and make sure there are adequate clearances.

## SIZES OF FURNITURE (most commonly used in living room)

Article	Sizes
Sofa	2 ft. 6 in. to 3 ft. 6 in. deep by 6 to 7 ft. long
Wing chair }	2 ft. 4 in. to 2 ft. 10 in. by 2 ft. 4 in. to 2 ft. 10 in.
Club chair }	
Straight chair	1 ft. 6 in. by 1 ft. 6 in.
End table	1 ft. 2 in. by 2 ft. or 1 ft. 5 in. by 1 ft. 5 in.
Coffee table	2 by 3 ft.
Bridge table (folding)	2 ft. 6 in. by 2 ft. 6 in.
Round tables	2 to 3 ft. (diameter)
Secretary	1 ft. 6 in. to 2 ft. deep by 2 ft. 8 in. to 3 ft. 6 in. long
Upright piano	2 by 5 ft.
Grand piano	4 ft. 10 in. to 5 ft. wide by 5 ft. 10 in. to 6 ft. 9 in. long

Piano bench	1 ft. 2 in. to 1 ft. 4 in. deep by 3 ft. long
Bookcase	10 to 12 in. deep by 2 ft. 6 in. to 3 ft. long
Rugs (large)	9 by 12 ft. or 9 by 15 ft.

## CLEARANCE DISTANCES—FOR FURNITURE USE AND CIRCULATION

Space between two pieces of low furniture	1 ft. to 1 ft. 8 in.
Space between high furniture and wall	2 ft. to 2 ft. 6 in.
Space between table, desk or piano, and wall (including chair when occupied)	3 ft. to 3 ft. 6 in.
Space beyond bridge or straight chair for occupant's feet	1 ft. 6 in. to 2 ft.
Space beyond sofa, lounge or club chair for occupant's feet	2 ft. to 2 ft. 6 in.
Space between club chairs or between chairs and sofa for conversation	5 to 7 ft.
Major path of circulation (traffic)	4 to 6 ft.
Minor path of circulation (traffic)	2 ft. 6 in. to 4 ft.

## SIZES OF DINING-ROOM FURNITURE

Article	Size
Table	Varies—Rectangular (to seat 6 persons): 3 ft. to 3 ft. 6 in. by 5 to 6 ft. Round: 3 to 6 ft. (diameter)
Chairs	1 ft. 6 in. by 1 ft. 6 in. or 1 ft. 8 in. by 1 ft. 8 in.
Buffet	1 ft. 8 in. to 1 ft. 9 in. deep by 4 to 5 ft. long
Chest	1 ft. 6 in. to 1 ft. 8 in. deep by 2 ft. 8 in. to 3 ft. 8 in. long
China cupboard	1 ft. 6 in. to 1 ft. 8 in. deep by 3 to 4 ft. long
Serving table	1 ft. 8 in. deep by 3 to 4 ft. long
Round serving table	2 ft. 2 in. to 2 ft. 4 in. (diameter)

## CLEARANCES

Space between edge of table and back of occupied chair	1 ft. 6 in. to 1 ft. 8 in.
Clear space or passage around table for serving, measured from table to wall or piece of furniture	3 to 4 ft.
Kitchen dining—space from front of kitchen work space to dining table	4 ft. 2 in. to 5 ft.
Built-in dining booth (4 persons)	4 ft. deep by 6 ft. wide

## SIZES OF BEDROOM FURNITURE

Article	Size
Beds:	
Single	3 ft. by 6 ft. 10 in.
Twin	3 ft. 8 in. by 6 ft. 10 in.
Three quarter	3 ft. 6 in. to 4 ft. by 6 ft. 10 in.
Full	4 ft. 6 in. by 6 ft. 10 in.
Junior	3 ft. 2 in. by 6 ft.
Crib	1 ft. 10 in. to 2 ft. 6 in. by 3 ft. 6 in. to 4 ft. 10 in.
Bed tables	1 to 2 ft. square
Dressers	1 ft. 8 in. to 2 ft. deep by 3 to 4 ft. long

## PLAN ANALYSIS

Chest of drawers	1 ft. 6 in. to 1 ft. 8 in. deep by 2 ft. 10 in. to 3 ft. 4 in. long
Wardrobe	1 ft. 7 in. to 2 ft. deep by 3 ft. 10 in. long
Dressing table	1 ft. 6 in. to 1 ft. 8 in. deep by 3 to 4 ft. long
Bench	1 ft. 6 in. by 2 ft.
Chairs:	
Straight	1 ft. 6 in. by 1 ft. 6 in.
Boudoir	2 ft. 4 in. to 2 ft. 8 in. by 2 ft. 4 in. to 2 ft. 8 in.
Chaise longue	2 ft. to 2 ft. 4 in. deep by 4 ft. to 5 ft. 6 in. long

## CLEARANCE DISTANCES FOR FURNITURE USE AND CIRCULATION

Space around bed for making	1 ft. 6 in. side 2 ft. at foot
Space from bed to wall for night table	1 ft. 6 in. to 2 ft.
Space between twin beds	1 ft. 6 in. to 2 ft.
Wall space for twin beds	9 ft. 8 in. to 10 ft.
Space between furniture and wall	1 ft. 6 in. to 2 ft.
Space in front of dresser or chest for pulling out drawers	2 ft. 6 in.
Space between bed or furniture and wall for dressing	3 to 4 ft.

## SIZES OF BATHROOM EQUIPMENT

Article	Size
Bathtubs	2 ft. 6 in. to 3 ft. by 4 ft. 6 in. to 6 ft.
Lavatories	1 ft. 3 in. to 2 ft. deep by 1 ft. 6 in. to 2 ft. long
Toilet	1 ft. 10 in. to 2 ft. wide by 2 ft. to 2 ft. 6 in. deep
Shower	2 ft. 6 in. to 3 ft. 6 in. square
Bathinette	2 by 3 ft.
Clothes hamper	8 in. to 1 ft. deep by 1 ft. 6 in. to 2 ft. wide

## CLEARANCES FOR FIXTURE USE AND CIRCULATION

Space from front of toilet to wall	1 ft. 8 in. to 2 ft.
Space between front of toilet and other fixtures	1 ft. 4 in. to 1 ft. 8 in.
Space from center of toilet to another fixture or wall	1 ft. 2 in. (min.)
Space from front of lavatory to wall or other fixtures	1 ft. 8 in. to 2 ft.
Space from edge of tub to wall	2 ft. 6 in. to 3 ft.

## SIZES OF KITCHEN EQUIPMENT

Article	Size
Kitchen cabinets:	
Base	15, 18, 21, 24, 30, 36, or 48 in. wide by 21, 24, or 25 in. deep by 35 or 36 in. high
Wall	15, 18, 21, 24, 30, 36, or 48 in. wide by 12 or 13 in. deep by 12, 18, 30, 45, or 54 in. high.
Refrigerators	2 to 4 ft. wide by 2 ft. to 2 ft. 4 in. deep by 5 to 6 ft. high
Ranges	3 to 5 ft. wide by 2 ft. to 2 ft. 6 in. deep by 3 ft. high (to top of cooking surface)
Ironing board (built-in)	4 ft. to 4 ft. 8 in. long by 1 ft. to 1 ft. 4 in. wide.

**Note:** Cabinets come ready-made in wood or steel in above sizes, with 3 to 3½ in. toe space under base cabinets. Doors may swing in either direction. Base cabinets are equipped with drawers or shelves. Cabinets may be grouped in any desirable combination.

## CLEARANCES

Space above top of work surface to bottom of wall cabinet	15 to 18 in.
Space (clear) in front of cabinets or sink for working	2 ft. to 2 ft. 6 in.
Space (minimum) between equipment for working	4 ft.
Height to reach up for objects (without use of stool or step-ladder)	6 ft. 2 in.

# JUDGING HOUSE CONSTRUCTION

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HISTORY AND RECORDS—BASEMENT—FLOORS—CEILING AND  
WALL FINISH—TRIM—DOORS—WINDOWS—STAIRS—ATTIC  
—ROOF—ROOF DRAINAGE—EXTERIOR WALLS—CHIMNEY—  
FIREPLACE—ELECTRIC WIRING—PLUMBING—HEATING—  
OUTDOOR AREA—BUYER'S CHECK LIST

A GOOD house, worthy of your money, must be structurally sound. This does not imply that all materials and workmanship must be of the highest quality. Like most articles of every day use, the very best is a luxury few can afford. But a good house must be built of good materials, suitable for their purpose and assembled in a workmanlike manner.

Whether you build or buy a house it is important to recognize the earmarks of good construction. This is possible without the bother of mastering technical details. Much of it is only common sense.

To treat the subject of construction from the two viewpoints of buyer and builder would lead to needless repetition since the problems are similar. In consequence, although the purpose of this discussion is to establish a basis for judging the construction of an existing house, it should be remembered that most of the facts and suggestions apply equally to the problems of building.

## HISTORY AND RECORDS

Much can be learned about a house from its history and the existing records of its life, all of which help determine its quality.

In the first place you will want to know when the house was built and, if possible, its original cost. If the seller cannot give you this information or you question its accuracy, you can probably find it recorded in the local administrative office where building permits are issued. This record will not be an exact statement of original cost but only an approximation, an estimate based usually on the contract price and invariably less than the actual cost.

To know the value of any and all mortgages held against the property and by whom they were held may be an accurate indication of the appraised value of the property. Records of mortgages are available at the recorder's office in the county courthouse.

At the same time it is desirable to learn why and for whom the house was built. Was it built for an owner who lived in it himself? Was it built for sale? Or was it built for rental? It is probable that the quality will decline in the same order.

This does not deny that there are many examples of well-constructed houses

built for immediate sale by competent and experienced real estate developers or building contractors. Successful developers know that well-built, well-planned, attractive houses are easiest to sell. Moreover, many developers, by building a group of houses at one time, effect savings in cost which are passed on to the buyer. Much will depend upon the reputation of the builder and the developer.

Of one thing, however, you may be certain nine times out of ten. If a house has been built for rental, its quality is questionable. Any builder whose first interest is return on his investment in the form of rent, you may be fairly certain, will invest as little as possible.

After you know when a house was built, why it was built, and for whom it was built, your next question should be, "Who built it?"

The actual work was probably done by a contractor with the assistance of subcontractors. It is generally possible to measure roughly the quality of their work by their reputations. Do not hesitate or neglect to inquire, but keep in mind that the opinions of persons associated with building—architects, contractors, bankers, realtors, material dealers—are worth more than opinions of average laymen.

If a registered architect was employed to design, plan, and supervise the construction of a house, of course it reflects professional skill and, consequently, quality. If the owner has exercised due care, no doubt copies of the drawings and specifications are available. When you buy the house you should insist on having a copy of these for reference. It is advisable to determine whether changes were made during construction and to note these on the drawings if that has not already been done. If at some future time you decide to remodel or enlarge the house, an accurate description of existing construction will usually help to reduce the cost.

During your conversations with the owner, architect, contractor, or others who may have knowledge of the house, it is well to learn what difficulties, if any, were experienced during construction. For example, it is important to know whether water was encountered when the basement was excavated. If it was, and the basement was not properly drained or otherwise protected, it is possible that water may periodically enter the basement.

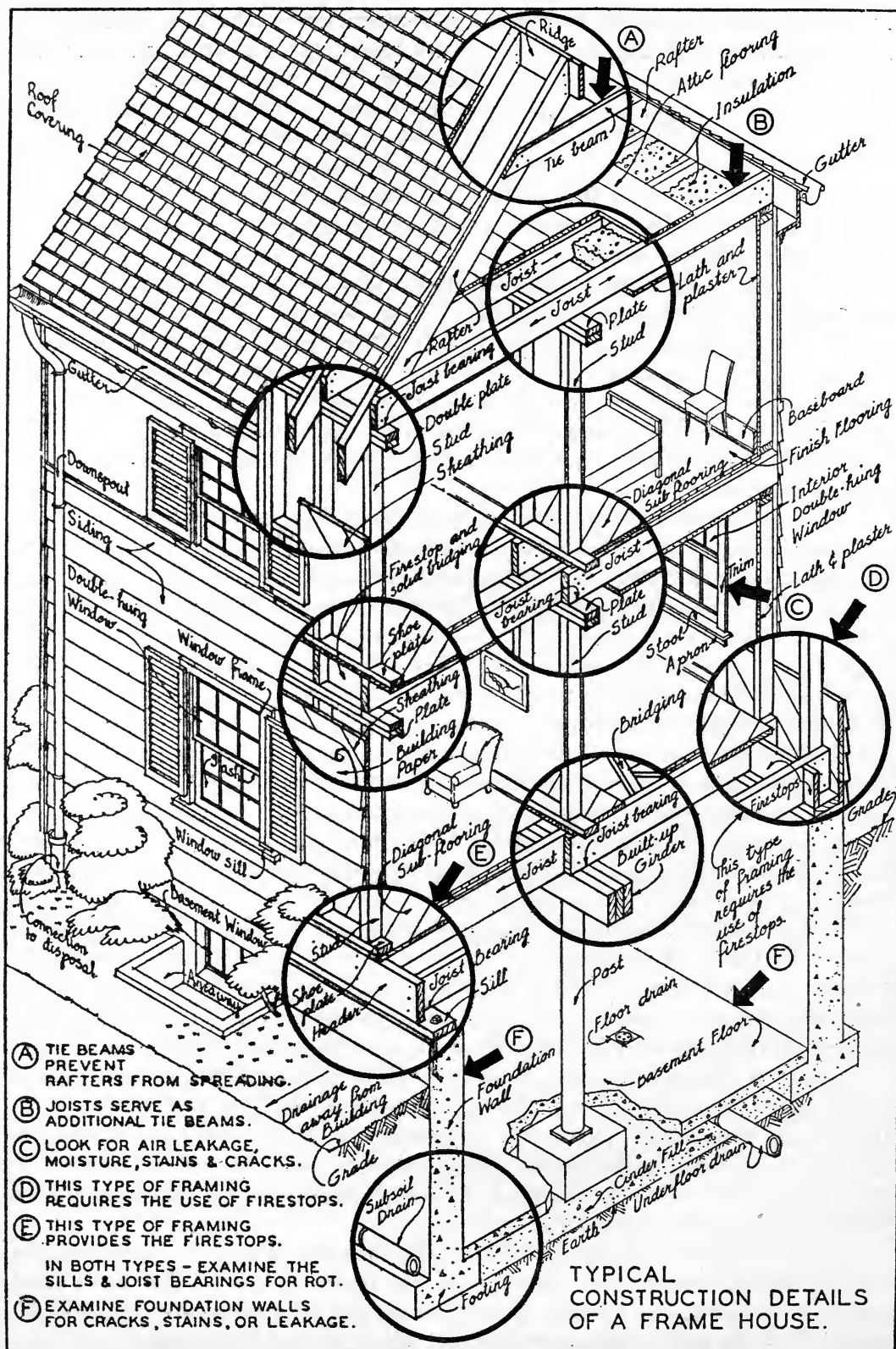
Unless you are considering the purchase of a new house, it is desirable to know the history of occupancy of a house. One that has been occupied continuously by the owner has more than likely had good care. Houses operated as rental properties are usually subjected to harder usage and poorer maintenance. In general, property that is rented tends to depreciate more rapidly.

You can seldom learn all you want to know about a house without talking to interested persons, and not all the information you get may be reliable. A tenant may "run down" a house to a prospective buyer to avoid the necessity of moving, or an overzealous, unscrupulous salesman may tell you things about it that are figments of his imagination. It is only logical to ask how you can tell whether a statement is true or false.

If you are ever in doubt about the reliability of a statement by a person who has a **financial interest** in the property, or who represents such a person—a salesman, for instance—ask that the statement be put in writing over the person's signature. If he makes excuses, refuses, or agrees to and then neglects to do so,



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TYPICAL CONSTRUCTION DETAILS OF A FRAME HOUSE.



the information is probably false. If he does put the statement in writing and it later proves to be false, you have the right to enter a claim for any damages you suffered as a consequence. Courts have also awarded damages for false verbal statements made in the presence of witnesses.

An inspection of property should not be made hastily. It may be necessary to make your first visit in the company of the owner or his agent. This is even desirable in order to gain as much information as possible about the history of the property. However, if the property interests you sufficiently, you should make your real inspection without the distraction of others. Be sure that you have plenty of time to see everything of importance on the inside and outside and from top to bottom. Better yet—take a check list with you.

### BASEMENT

Determine first whether the basement extends under the entire house. If it does not, determine whether unexcavated areas are accessible. Pipes, ducts, or wiring should be accessible for possible repairs. Clearance in unexcavated areas should be at least 2 ft. 6 in. and in the basement proper there should be sufficient headroom to permit walking in an upright position without danger of bumping pipes, ducts, or other obstructions. Clearance should be at least 6 ft. 6 in., but a full 7 ft. is safer.

Starting your examination with the lowest element of the house, determine what types of **drainage**, if any, have been provided to carry off ground water **before** it gets into the basement. The common types are **underfloor drains** placed, as the name implies, under the basement floor, and **subsoil drains** installed around the outside of the basement wall near the level of the basement floor. Both are designed to carry ground water away from the basement floor and walls.

Not all basements will need underfloor or subsoil drains, but if there is evidence of ground water or adjoining property owners are troubled with water, either or both types should be provided.

Both types consist of tile set end to end. The joints are left open to permit water to seep into the drain to be carried away. Neither type of drain can be seen after it is installed and it is usually undesirable to open the basement floor or dig up the lawn to examine them. Their existence may most easily be checked by a written statement from the owner.

Underfloor and subsoil drains should discharge by gravity into a sewer, a dry well, or a cesspool, but if this is not possible they may discharge into a sump, which is a covered, walled pit often located under the basement floor. The water that collects in a sump is then pumped to a level high enough to discharge by gravity into a sewer or other means of disposal. The usual pump for this purpose is an electrically driven unit which operates automatically.

Piping systems of all types need cleaning, and openings called "cleanouts" are provided for this purpose. A cleanout is a section of pipe with a removable screw plug. Removal of the plug permits the insertion of a flexible rod designed to remove obstructions. Cleanouts are not ordinarily installed in the underfloor or subsoil drains of a house, but if they have been provided it is possible to test

## JUDGING HOUSE CONSTRUCTION

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the drain by discharging water from a hose into the cleanout. The water should drain completely and quickly.

In addition to preventing water from entering the basement it is necessary to drain water from the basement. **Floor drains**, usually of perforated cast iron set flush with the floor, should be located at the lowest points of the basement floor. Like the other drains, floor drains should connect to a sewer, cesspool, or dry well, preferably by gravity flow. If this is not possible, a sump pump such as that described above should be provided. Floor drains can easily be checked for satisfactory operation by pouring water into them.

A **footing** is a slab on which the walls, posts, or piers are supported. Footings may be concrete, brick, or stone. They transfer the weight of the house to the earth below and exist in good construction.

Wall footings are generally poured concrete; they project 4 to 6 in. on each side of the wall and are 8 to 12 in. thick, depending upon the weight supported and the bearing capacity of the soil. Footings for posts or piers are generally poured concrete at least 1 ft. square and 8 in. thick. Since footings cannot be seen when a building is completed, you will have to accept the word of the owner or builder for their adequacy. Exterior masonry wall cracks are often evidence of settlement resulting from inadequate footings or their entire omission.

The **basement floor** is usually concrete. It should be smooth, free from excessive wear, cracks, breaks, or sandiness, and should slope uniformly to a floor drain. A brick or stone floor may be satisfactory but difficult to clean. Wood floors or linoleum-covered floors are seldom satisfactory unless special precautions have been taken to eliminate the inherent dampness of the earth and basement floor.

Earth floors represent a short cut in construction cost and should be avoided if you wish to keep your home free of vermin.

While you are examining the basement floor, be sure to observe any evidence of water. An excessively damp or wet floor may be flooded during rainy seasons.

Basement foundation walls may be built of stone concrete block, cinder concrete block, new brick, reclaimed brick, poured concrete, or stone. All are suitable building materials.

In recent years stone concrete blocks are most commonly used. They should be of uniform good quality, hard, and resistant to absorption of water. Cinder concrete blocks are more porous and hence less resistant to the absorption or passage of water. They should be avoided where there is excessive ground water. New brick foundation walls are satisfactory, especially if the brick is hard and impervious. Reclaimed or secondhand brick is often used to save cost and if of good quality can be entirely satisfactory. Regardless of whether brick is new or used, hard brick is preferable to soft brick, which can be scratched or chipped with a pocket knife. A poured concrete wall, which is solid concrete without joints, is a first-class wall but often too expensive for the average small house. Basement walls are seldom built of dressed stone because of its cost, but they are often built of rough stone when it is available and inexpensive. Stone may have come directly from the excavation.

When examining any type of basement wall, look first for structural failures

or weakness. This is indicated by large cracks, breaks, or a bulging of the wall. Any holes, or cracked, broken pieces are indications of weakness. A structurally sound wall is "plumb and true." It is **plumb** when it is vertical as contrasted to sloping inward or outward, and **true** when it is built in a straight line as contrasted to a wavy irregular line.

Check the wall for evidence of water leakage. Look for dampness, trickling water, discoloration, stains, or a high-water mark indicating flood.

The strength of a wall built of masonry units is dependent upon the strength and quality of the mortar joints. Be sure that mortar fills the space between blocks and that the mortar is tight. If it can be loosened or removed with a pocket knife, the quality of the wall is poor.

For a small house the foundation walls should be at least 8 in. thick for concrete block, poured concrete or brick, 12 in. for dressed stone, and 14 in. for rough stone. The wall thickness can be checked at window and door openings, but since the thickness may not be uniform throughout the house, check the thickness in more than one place.

The **structural framing** of the house can best be observed and judged in the basement because there the framing lumber is usually not concealed by plaster or other covering.

Framing lumber is described by its nominal dimensions and a piece is called a 2 by 4, a 2 by 6, or a 2 by 10, depending upon its size in inches. However, the actual size is less than the nominal size because some wood is removed when the lumber is smoothed. This amount varies from  $\frac{3}{8}$  to  $\frac{1}{2}$  in. Thus a 2 by 4 is actually  $1\frac{5}{8}$  by  $3\frac{5}{8}$  in. and all other sizes are correspondingly reduced.

A floor is supported by a system of joists, girders, posts, and walls, all of which, together with many other notes, are shown in the illustration on page 84.

**Joists** are wood beams, generally 2 in. wide spaced 16 in. on centers. They are supported at their ends by either a wall or a girder and the length of contact (joist bearing) between the joist and its support should never be less than 3 in. The joists in turn support the rough and finished floor above. If there is a finished ceiling it is secured to the underside of the joists.

The size of joists depends upon the distance between supports. They may be thicker than  $1\frac{5}{8}$  in. but should never be thinner. They may be spaced closer than 16 in. on centers but the spacing should not be greater. The desirable depth will vary as the distance between supports and can be calculated by rule of thumb as follows: For joists 16 in. on centers, the distance between supports in feet, divided by 2, plus 2 equals the required depth in inches. Thus the depth for a span of 14 ft. between supports would be  $14 \div 2 = 7$ , plus 2 = 9 in. Since framing lumber comes in even increments of 2 in., a 9-in. depth is not standard. The joist in this case should be a 2 by 10, the next larger size. Any increase in the size will result in a stronger, stiffer floor.

**Bridging** refers to the braces or system of braces used between the floor joists to stiffen them and distribute the load. It is highly desirable but sometimes omitted to save cost. The omission indicates work of poor quality. Satisfactory bridging, illustrated on page 84, is of two types: (1) cross bridging made from 1- by 2-in. boards arranged crosswise between joists, (2) solid bridging made from

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solid pieces of wood fitted between the joists. Bridging should be spaced so that there will be one continuous line of either type near the center of each joist span.

**Girders** are the beams that support the ends of joists together with the weight of the construction above. They may be of solid wood, or may be built up from several vertical pieces nailed or bolted together. In work of better quality they are of steel, thus eliminating the possibility of shrinkage and resultant defects. Girders are supported by posts or columns of wood, steel, or cast iron, or by piers of brick, concrete block or stone. All are satisfactory.

**Firestops**, also called "mouse stops," are not structural since they carry no load, but they are related to the quality of the structural system and are illustrated on page 84. Fire stops close off any opening that would allow fire, mice, air, or smoke from the basement to enter the upper walls of the house. Some types of construction accomplish this by the method of construction. In other types, wood-blocking, bricks, or sheet metal is used to close such passages. In case of fire the fire stops prevent the spaces in the upper walls from acting as flues and thus prevent the rapid spread of fire into the walls.

The **species of wood** commonly used for structural lumber are yellow pine, white pine, hemlock, fir, and oak. Some of these woods are stronger and have more desirable properties than others, but if the wood is in good condition, free from large loose knots, open knotholes, cracks, breaks, saw cuts, notches, waness, and similar defects that decrease the strength, any of the species listed are satisfactory.

New material is usually preferred because of its appearance, but secondhand lumber is often in excellent condition and may be fully as good as new lumber in strength and durability. In fact, it may be better if the new lumber is too "green." All new lumber should be well seasoned at the time it is used for building. If it is not sufficiently dry it will shrink in depth and cause floors to settle unevenly and plaster to crack. Secondhand lumber, because of its age, is naturally well seasoned. However, if you are the seller, you may have trouble convincing a prospective buyer that secondhand lumber is quite as good as new.

In order to judge the condition and probable life of structural lumber it is essential to understand something of the characteristics of wood.

Wood shrinks or swells as it dries or absorbs moisture.

If wood is properly seasoned and is kept dry and well ventilated, it will last indefinitely. In many buildings over a hundred years old the original wood is still in good condition.

Wood that is continuously under water will last indefinitely. But wood that is alternately wet and dry, or wood that is in a damp, humid, poorly ventilated space will rot in a comparatively short time. If you forget the other characteristics, remember this one. This condition is often present in a house, particularly in a basement.

Possible **structural defects** and all evidence of structural failure should be carefully investigated.

One of the most important and least obvious defects is **dry rot**. This is the deterioration or rot resulting from excessive dampness or improper ventilation. It usually occurs where wood members, particularly the joists and sill, bear on

masonry walls but may occur in other locations as well. It is imperative to check for dry rot and this can most easily be done by trying to stick a knife blade into the wood. If the blade goes in and comes out easily, meeting little resistance, the wood is rotted or softened and should be replaced. If dry rot occurs in a number of places, look for another house. The condition can be remedied only by tearing out rotted pieces and replacing them, which may mean tearing up an entire floor. Then the condition that caused the rot must be corrected.

Termites will cause a similar deterioration since they feed on wood fiber, eating away the inside of each piece. The knife-blade test can also be used, and again, if deterioration is excessive, look for another house. In localities subject to termites, new construction should be protected by the relatively inexpensive precaution of providing metal termite shield between the foundation and the wood superstructure.

Cracks, large loose knots, or breaks in framing lumber reduce its strength. If there is bark on the edges of framing lumber, or if the edges are tapered indicating that bark has been removed, the piece is consequently weaker than it should be. In some instances you may even find joists actually broken or badly split. This can occur if there is a large knot at a critical point or may even result from cutting or notching to permit the installation of pipes, ducts, wires, or other mechanical equipment. Holes or notches deliberately cut in joists should preferably be toward the ends. If they must be near the midpoint, they should not be at or near the bottom edge.

The entire framing system visible in the basement should be examined for sagging. Sag is excessive bending. If it is noticeable you may be certain that it is excessive. It may result from joists or girders of inadequate size or from lumber improperly seasoned. Whatever its cause, it is evidence of undesirable quality.

The basement and the attic are usually the only places where the quality of structural workmanship is visible. Look carefully there for evidence of poor or careless workmanship. Look for poor fitting of pieces, imperfect saw cuts, and bent nails not driven into the wood. If the quality of visible workmanship is poor, you may be certain that the quality of hidden workmanship is no better. It may be much worse.

## FLOORS

Floors receive as hard wear as any portion of a house and definite conclusions about their quality and condition should be reached. A good wood floor consists of three separate layers. First, what is called the subfloor is laid over and nailed to the top of the joists. Then this subfloor is covered with a layer of heavy building paper. On top of this the finished floor is laid.

**Subflooring** usually consists of 1- by 4-in. boards laid either at right angles to the joists or diagonally. To lay them diagonally requires more labor time and slightly more material. Consequently the cost is slightly higher, but this is repaid by greater strength. Subflooring is sometimes omitted to save costs. Its omission is evidence of poor quality. By examining the basement ceiling between the joists determine whether what you see is subflooring or only the underside of the finished floor above. By close scrutiny of the cracks you can see whether there is a



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layer of building paper between the two floors. This layer retards the passage of sound and prevents the passage of dirt and dust.

The **finished flooring** may be either hardwood or softwood, but the first is preferred. Oak, maple, and birch are considered the better woods because of their resistance to wear. Flooring is commonly cut in two different ways, called "edge" grain and "slash" grain. Edge-grain flooring is cut at right angles to the grain and is more resistant to wear. Slash-grain flooring is cut parallel to the grain. It is less resistant to wear, is more likely to "sliver," and will probably vary considerably in grain pattern and color. If only short lengths of finished flooring were used, the builder saved a few dollars by using cheaper material.

Flooring may be hidden-nailed, face-nailed, or pegged. The first is most common and preferred. The second shows the nail heads and represents cheaper quality, while pegged floors are a luxury justified only by appearance.

Wood floors may be covered by carpets or linoleum, and a shrewd buyer should determine whether any of these conceal poor flooring. This is particularly important for linoleum, which, if new, will look good, but if laid over a rough, uneven floor will quickly wear and crack. When examining a new linoleum floor in an old house, examine it on hands and knees, pressing it down to see if the underfloor is level and solid.

It is difficult to conceal defects in a floor system or its materials, but an examination should nevertheless be made cautiously. Keep in mind that the floor system, the walls, and the roof are the structural skeleton of the building to which everything else attaches. If the skeleton is weak, the building is of poor quality.

First of all notice whether the floors are sound. They should be stiff and secure, level and true. Sagged, sloped, or irregular floors may be caused by insufficient strength, settlement, excessive shrinkage, or rotting of joists. Floors may bulge upward as a result of wetting or dampness which causes the flooring to expand and buckle. The floor should not vibrate or shake underfoot. Do not hesitate to spring your weight up and down or jump lightly on the floor. Note whether vibration is transferred to the rattle of furniture or the tinkling of glassware. The first floor may possibly be stiffened by wedging the joists tight or by the installation of bridging, but nothing can be done for the upper floors unless you are willing to remove lath and plaster or the flooring, either of which is expensive.

Look for loose, squeaky boards. These can be corrected by face-nailing, but if there are many such boards they are evidence of poor workmanship or deterioration. There should be no wide cracks as evidence of poor workmanship or shrinkage due to improper seasoning. The surface of all wood floors should be smooth. Rough floors caused by wear may require sanding and refinishing. In severe cases the floor may have to be replaced. Stains, discolorations, blemishes, burns, gouging, and slivering are usually minor defects easily remedied by refinishing.

The best flooring material can be ruined by poor workmanship. Pay particular attention to poor fitting at joints, imperfect saw cuts, poor nailing, hammer marks, and damage to the edge or face of a board due to careless handling.

## CEILING AND WALL FINISH

Ceilings should be flat and level, walls should be plumb and true. Any deviation from these characteristics is evidence of weakness or defects and, consequently, of poor quality. Large plaster cracks will need attention, but small hairline cracks are unavoidable and occur in the best of homes. Be on the alert for plaster cracks starting at the upper corners of window and door openings and running out at an angle. These are evidence of structural weakness.

In work of good quality a corner bead—a narrow strip of metal—is used at all corners in plaster walls. This protects plaster from damage at the corners and also holds corners true to line during construction. The corner bead can be seen when a corner is examined closely. If it is concealed by paint or paper, tap the corner lightly with a hard object. The resulting “ring” or “thud” will tell you whether the corner is metal or plaster.

If walls and ceiling are finished with plaster, notice whether it is bruised, chipped, broken, cracked, or stained by leakage of water or air. The wall or ceiling finish may be paint, enamel, kalsomine, paper, paneling, tile, linoleum, or one of many other materials now available. The type of finish is a matter of preference but examine all to determine their condition.

Many old houses are so well built that they can be put in good condition by redecorating. But here it is necessary to add a warning: a few sharp, unscrupulous owners or real estate operators are not above doing a complete but cheap redecorating job to conceal poor quality, confident that they can catch an unwary buyer impressed only by cleanliness and attractive color. Don't let this happen to you.

## TRIM OR WOODWORK

The trim or woodwork includes the casings around doors, windows and other openings, the baseboard, moldings, and paneling. A contractor invariably assigns his best craftsmen—finish carpenters—to this work because it is all conspicuous. Again the buyer should consider it carefully as an index of the quality of workmanship. Examine the joints critically.

Trim may be hardwood or softwood. Hardwoods are not so easily marred, dented, or bruised, but are generally more expensive. If trim is marred, bruised, loose, or if parts are missing, it may require refinishing or replacement. Loose pieces of trim are sometimes lost or destroyed and often new pieces for replacement are comparatively expensive if the pattern is no longer available in stock. Baseboards and their shoe moldings are usually subjected to hardest usage through careless sweeping and cleaning. There may be objectionable defects in the wood such as knots, cracks, or pitch pockets. If trim is knotty pine, the knots are desirable, provided they are tight and not too large. Defects in trim can be hidden by paint and are relatively unimportant except for rough surface imperfections that are difficult if not impossible to obscure.

## DOORS

Unless doors are seriously warped, broken, cracked, split, marred or otherwise defaced, it is rarely necessary to replace them. The doors may bind, or they may



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be loose. Though either condition may result from poor fitting or workmanship, they may result only from the normal shrinkage and swelling of wood under varying humidities. In any case the condition can easily and quickly be remedied by a carpenter. In fact it is invariably necessary to have a carpenter refit some of the doors of a new house after the first change of season.

It is more important to be concerned about exterior than about interior doors. If exterior doors do not fit properly they admit cold air which causes drafts and heat loss. The threshold should be in good condition, preferably of oak, but better yet, of metal. Note whether exterior doors are weather-stripped, and do not neglect to check the screen doors and storm doors. Can they be easily installed and removed?

Hardware is usually a fair indication of a builder's interest in quality. It varies in price over a wide range and the cheap and the expensive may look almost alike. If you can learn the manufacturer's name, you usually can determine the price from a catalogue in the local hardware store. For durability and the prevention of warping, three hinges are better than two. A heavy exterior door or a door with a full-length mirror should always have three hinges.

## WINDOWS

The most common types of windows are the double-hung, the casement, and the fixed-sash. **Double-hung** windows are those in which the lower section moves upward and the upper section downward when the window is opened. **Casement** windows are generally hinged at the side, but may be hinged at top or bottom, and they may swing in or out. **Fixed-sash** windows are stationary and have no provision for opening.

The portion of a window in which the glass is installed is called a sash. In double-hung windows the sashes are usually counterbalanced with concealed weights to hold the window in any position. This may also be done by springs. However, in older houses the windows may not be counterbalanced at all; so do not neglect to check them. The condition can be remedied, but only at added expense. The concealed weights are held by sash cord which looks like clothesline and can be seen. Examine it for wear. The strips of wood that hold the sash in position and form a guide for it are called "stops." On a cheap window the stops are nailed; on a better job they are secured by screws to permit easy adjustment.

A common short cut is the omission of locks and window lifts, both of which are indispensable. Be sure that they have been installed.

Casement windows should be checked to determine whether those swinging in may interfere with furniture and draperies or those swinging out with screens or storm sash. Each window should be equipped with a lock and an adjuster to hold the sash in place when open.

Fixed sashes are obviously the least expensive, though their quality may be excellent.

Check all windows for rot and loosening at joints in the sash and the frame. If the frame and sash are not weathertight there will be leakage of cold air and may even be leakage of water during heavy rain. Leakage can be noticed in cold or windy weather by running your hand or a lighted match or candle around

the edge of the frame. There will ordinarily be some leakage, but it should not be noticeable. Dust streaks or water stain around the window trim is evidence of leakage. The window sills both inside and out should be checked for rot and loose joints, particularly in corners.

If you are considering a new house, take into account the possible expense caused by the omission of window shades, curtain hardware, screens, and storm sash. If these are present, be sure that they are included in the purchase price. If the house is not new, the present occupant may decide to take them with him. In fact, if the occupant rents, the shades, screens, and storm sash may be his property and not for sale.

While considering the purchase of a house you may contemplate removing or adding windows or doors. If so, do not assume that the cost will be a minor item. It may be considerably more than you anticipate, depending upon its relation to other work. To be on the safe side, get an estimate of cost from a reliable contractor before deciding to buy.

### STAIRS

Stairs should be stiff, level and true, with no indication of settlement, vibration, or movement underfoot. Jump on them. Any departure from this description is evidence of structural weakness.

The framing which supports a stair is called a **carriage**. This is a plank cut in saw-tooth fashion to support the **treads** on which you step and the vertical boards called **risers**. Wood stairs should be supported by two and preferably three carriages, each of which should be not less than 1½ in. thick. Furthermore, the carriages should be free from knots, cracks, or other defects and should be adequately supported at the top and securely anchored at the bottom. The construction may be concealed by plaster on the upper floors but is usually open to inspection in the basement.

Objectionable squeaky stairs may result from two causes. If the squeak is at the top or the bottom it is probably caused by faulty support and is not easily fixed. If it occurs between the top and bottom it is probably a loose tread that can easily be made secure.

If stair treads or risers are seriously worn, marred, cracked, splintered, or otherwise defaced, it may be necessary to repair or replace them. It is well to recognize that this may involve matching the finish and that may mean refinishing the entire stairway.

While noting the structural characteristics of the stairs it is well to judge their width and arrangement in relation to the furniture to be carried up and down. If you own a box spring for a double bed, be sure to determine whether you can get it around all corners and up the stairs to the second-floor bedrooms.

Be sure that the stair arrangement is not hazardous. Straight stairs are safest. If they must turn, a landing at the turning point is safer than winding stairs. The latter should be avoided.

All risers should be exactly the same height. A small variation will cause tripping. A stair which rises more than 7¾ in. for a tread of 10 in. is too steep and

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consequently dangerous. This is especially true for basement stairs that are often used by a person carrying a basket or heavy object.

All stairways should be provided with railings and wall rails which are tight and well secured. Loose rails are usually a sign that a home has had rough usage and careless maintenance.

Throughout the entire stair system there should be adequate headroom. Clearance should never be less than 6 ft. 4 in., and pay particular attention to the headroom of basement stairs. When going up the basement stairs, to be sure you clear, lean backward as though carrying a heavy load.

## ATTIC

Inspection of the attic is another opportunity to examine the structural framing. The discussion of framing lumber visible in the basement applies with equal emphasis to that in the attic.

**Rafters** are structural beams inclined parallel to the roof and they support the roof covering and any loads that come on the roof. Rafters should be 2 by 6 in. or larger, depending on the distance between supports. A 2 by 6 is satisfactory for the average small home about 24 ft. wide. The rafters are usually spaced 2 ft. on centers, and wider spacing is undesirable if roof boards are only 1 in. thick.

If insulation is installed, you will find it either between the rafters or between the attic-floor joists. Its absence represents a saving in cost and a probable future expense if winters are severe. To save cost many attics are not floored over the entire area.

The roof construction is a part of the structural skeleton already mentioned and its quality and condition are of vital importance. From a distance outside, note whether the ridge of the roof sags. Standing outside and in line with the base of the wall, look upward along the wall to see if it has moved outward near the gutter line. Both of these conditions are the result of rafters' spreading horizontally because of improper or inferior nailing and bracing. The condition cannot easily be corrected.

Be sure to notice whether the attic space is ventilated. If it is not, condensation will form during cold winter months, turn to frost or ice, and usually melt suddenly when warmer weather returns. The same thing happens to the freezing unit of an electric refrigerator and it requires defrosting. Defrosting an attic is much more serious.

Investigate all stains or marks that might be evidence of roof leaks. Look at the attic floor as well as the roof. Telltale pans or buckets may be placed under leaks as a temporary expedient. Stains on the ceilings below should be investigated.

Judge the workmanship of framing by examination of the joints where the rafters come together at the ridge of the roof. If these do not fit tight and snug, the workmanship is inferior.

Do not neglect to look for potential fire hazards in the attic. Look for charred wood near the chimney at both the roof and floor level. If you find charred wood, be sure the condition that caused it can be corrected before you buy the house.

## Roof

Roof covering is laid over roof boarding, called "sheathing," supported by the rafters. The sheathing is laid with open spaces between boards if the roof covering is wood shingles. This permits some circulation of air and prevents rotting. It is laid board to board if the roof covering is asphalt shingles, roll roofing, sheet metal, or slate.

Roof covering may be asphalt shingles, wood shingles, asbestos shingles, slate shingles, tile, galvanized sheet metal, copper, tarred felt and gravel, or roll roofing. Each type is offered in a number of grades. For your purpose it is not necessary to understand the merits and demerits of each type and grade or to be necessarily concerned about their relative cost. When you buy a house you will want the answer to two questions: First, "Is the roof in good condition now?" and, second, "How long may it be expected to remain in good condition?"

You can answer the first by examination, which should be made by getting onto the roof but may be made from an adjacent window. You can seldom see defects from the ground. Wood shingles may be curled, split, broken, loose, or missing. Asphalt shingles may be torn, curled, or pierced with holes. Asbestos shingles may be cracked or broken. Galvanized sheet metal may be rusted. Slate shingles or tile may be loose, broken, cracked, or missing. Roll roofing may be loose, torn, pierced, patched, or worn through.

To answer the second question it is advisable to consult a reputable roofing contractor. He will have to guess and will probably be conservative in his judgment, but at least his guess will be based on experience and knowledge.

## ROOF DRAINAGE

Water from the roof may be allowed to run off the roof, splattering water and mud on the walls of the house, or it can be caught in gutters, conducted to a downspout, and discharged onto the ground, into a sewer, or into a cistern or covered pit located at least ten feet from the house.

The most common type of gutter for the average house is a metal hanging gutter attached to the lower edge of the roof. The metal gutter may be of galvanized sheet metal or copper. The latter will last longer, but galvanized sheet metal is generally stiffer and stronger. Gutters supported by wire hangers are not so desirable as those supported by adjustable metal hangers. Sections should be soldered together but sometimes only slip joints are used.

Gutters may be built into the roof, but this is not customary in small houses because of the extra cost necessary to ensure against leakage. A leak in this type of gutter would permit water to enter the house while a leak in the hanging type would discharge water to the ground.

Gutters that are too small or are provided with too few downspouts will overflow during heavy rains. If you are in doubt about the capacity of a gutter and find it inconvenient to check during a heavy rain, a sheet metal contractor can usually tell at a glance.

Note the presence and the condition of all gutters and downspouts. They are

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subject to corrosion. They may sag badly. They may be loose or bent from the weight of ice and snow.

## EXTERIOR WALLS

The structural skeleton of a **frame** (wood) wall consists of vertical 2 by 4's called **studs**. These members rest on and are anchored to a wood plate or sill which is usually supported by the first-floor joists. A 2 × 4 in. plate resting on the top of the vertical studs supports one end of the roof rafters.

This system of support is strengthened by the application of a layer of **sheathing** outside. The sheathing may be 1-in. boards laid horizontally or laid diagonally for greater stiffness. Or the sheathing may be large sheets of manufactured fiber board of various kinds. Omission of sheathing in cold climates is an indication of questionable quality. The wood sheathing should be covered with a layer of heavy building paper or tarred felt to make the house weathertight and to conserve heat.

The finished exterior surface of a frame wall is generally covered with wood siding applied over the building paper but wood shingles, asphalt or asbestos shingles, sheet metal, and other materials may be used. In some localities siding is known as clapboards or weatherboards.

The interior surface is usually built by attaching lath or some other type of plaster base to the inside face of the studs. Over this a finished plaster surface is added. In order to conserve heat, an insulating lath is desirable on exterior walls or on interior walls separating rooms heated to different temperatures.

A **veneered masonry** wall is similar to frame construction except that a veneer, or surface of brick or stone, is substituted for siding. Veneered walls are generally satisfactory for small houses where walls are not over two stories in height. Even then the layer of brick or stone must be securely anchored to the wood frame behind at regular intervals.

**Solid masonry** walls are self-supporting and carry the entire load of the structure above. The interior surface may be plaster applied directly on the masonry, but if this is done there will be a tendency for moisture to condense on the plaster. To prevent this the wall is "furred." This is done by securing wood strips, usually 2 by 2 in. to the inside face of the masonry wall. Lath is nailed to these furring strips and plaster is applied to the lath. Thus, an airspace is left between the inside face of the masonry and the plaster. The furred wall materially reduces the tendency for beads of water to form on the plaster wall.

A **stucco-surface** may be applied to a masonry wall, a veneered wall, or a frame wall. Water entering small cracks in stucco can freeze, expand, and loosen the stucco. Consequently stucco walls are generally more satisfactory in localities enjoying a mild climate.

All wood siding and wood trim, whether in frame or masonry walls, should be examined. Boards can be loose, broken, bruised, cracked, split, rotted, or missing. Window frames and sash must be seen from the outside to determine the condition of the sill, frame, sash, and the putty that holds the glass in place.

If a house has a painted finish, the paint may be crazed (have small hairline cracks), chipped, or peeled and rough. If the surface is in very poor condition, it

may be necessary to remove the existing paint to ensure a good paint job. If this seems necessary, you can get an estimate of cost from a painting contractor.

The examination of all exterior masonry should be similar to that already mentioned in the discussion about the basement. Where the exterior finish of a house is both wood and masonry, pay particular attention to the line where the two materials join. These joints are difficult to keep watertight and weathertight.

### CHIMNEY

The chimney should be built with at least 4 in. and preferably 8 in. of good tight brick around a terra cotta flue lining. A chimney supported on its own foundation straight up through the roof is structurally preferable to one that starts at a higher level supported by a wood framework; this latter type is often found in older houses heated by stoves.

The smoke connection from furnace to chimney should be as short and direct as possible, and the chimney should be provided with a cast-iron cleanout door near its base to facilitate the cleaning of the flue and the removal of soot. Check all wood near the smoke connection and the heating unit for charring or any evidence of fire.

If there is insufficient draft, the chimney flue may be too small, the flue may be dirty and choked by obstructions, the path from furnace to chimney may be long and indirect, or the chimney may not be high enough.

Wherever the brickwork of the chimney is exposed to view, examine it carefully for soft bricks and for loose or open mortar joints as a precaution against fire, leakage of smoke, and falling bricks.

### FIREPLACE

If you consider a fireplace desirable, first determine whether the fireplace you see in the house is real or only a fake. Some are purely ornamental, with no flue or chimney. One built only for the use of gas as fuel may be desirable or undesirable according to your preference. Most people prefer a wood-burning fireplace that really works.

The supporting masonry for the fireplace should extend to the foundation. An ash drop is usually provided, equipped with a small metal door in the hearth floor and another metal cleanout door in the basement. This permits removal of ashes through the basement rather than the living room.

The **inner hearth**, which is the floor of the fireplace proper, together with the adjacent walls should be lined with firebrick, which is more resistant to heat than ordinary brick. Most types of ordinary brick will deteriorate rapidly if the fireplace is used much. Plaster walls within the fireplace proper should be avoided because the plaster will crack and fall off under high temperatures.

The **outer hearth** of a fireplace should be of stone, brick, tile, or other incombustible material and its size should prevent fire or sparks from the fire from reaching the wood floor or floor covering. A projection into the room of 18 in. is usually considered sufficient provided the outer hearth extends at least 9 in. beyond the sides of the fireplace opening. The outer hearth must be supported



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from below. If there is evidence of sagging or settlement where the hearth joins the wood floor, the construction is of questionable quality.

A **damper** is essential to control the fireplace draft which in turn controls the rate of fuel consumption. The damper is also a heat-saving device when the fireplace is not in use during cold weather. If there is no damper, or if the damper is open, warm air from the heated house escapes through the chimney and usually creates a noticeable draft. If you are considering an old house, be sure to check the presence of a damper for many were built without them. Furthermore, they cannot easily be added.

## ELECTRIC WIRING

With but little technical knowledge a prospective buyer can appraise many items of the electrical system of a house.

To prevent fire, personal injury or death, statutes usually require the electrical system of a new house to be inspected during construction and also upon completion. When the system is approved, a certificate is issued. This certificate may prove a valuable document if it is necessary to support a claim for insurance. You should insist on having the certificate transferred to you if you buy a house. If the certificate is not available or if the electrical system has been modified since the certificate was issued, an inspection should be ordered and a new certificate issued. In any event do this before you buy the house.

In older houses **knob and tube** wiring was used extensively: the insulated wires are supported by porcelain knobs, and porcelain tubes protect the wire when it passes through a wall, joist, or other obstruction. This type of wiring is easily damaged and consequently hazardous, particularly if it is old and the insulation has deteriorated. If you contemplate buying a house wired in this way, by all means have it inspected by a qualified person, preferably the official inspector.

**Armored cable**, known as "BX," consists of insulated wires protected by a spiral, flexible metal covering. This is material of good quality, though some object to its use because of the danger of conducting electricity through the metal covering if the insulation should be damaged in any way.

**Nonmetallic cable** is now used extensively in small homes. This type consists of insulated wires bound together into a single cable which is protected by a tough, resistant, nonmetallic wrapping usually dark gray in color. This cable is stapled to wood members and threaded through holes in walls, floors, or structural members.

Maximum protection is provided by **rigid conduit** wiring, wherein the insulated wires are pulled through solid continuous metal pipe. This quality of work is expensive and much above the price range of modest home construction.

There should be sufficient electrical outlets for your needs and they should be in usable locations. Check all switches for location to be sure that it is not necessary to grope through a dark room to reach the switch. Notice whether stairway lights can be controlled from either the top or the bottom of the stairway. You may be certain that each outlet and switch represents a construction cost



which enhances the value of the house. Their omission is an indication of niggardly saving.

**Fuses and circuit breakers** protect the house against fire caused by short circuits or overloaded wiring. They are a safety link in the electrical system, turning off the current before serious damage occurs. Ordinarily fuses are used; circuit breakers perform the same function but their original cost is higher. Look in the fuse box to see if a copper penny has been inserted in a fuse socket instead of a fuse. This is usually an indication that the electrical system is overloaded and consequently hazardous.

The price of lighting fixtures, like hardware, ranges from the very cheap to luxury quality. Do not neglect to notice the fixtures, but approval or disapproval is a matter of personal preference.

### PLUMBING

Your clue to whether the plumbing system has been satisfactorily designed and installed is its successful operation. If fixtures drain quickly and quietly you may be reasonably sure that the system is satisfactory. If drainage is slow, the pipes may be clogged or too small. If the drainage is noisy, resembling the "glurking" sound of pouring water from an enclosed tin container, it is reasonable to assume that the system is not properly vented. To be vented, provision must be made to let air into the system. This facilitates the flow of drainage.

Investigate the source of the water supply. A public supply is generally preferred, but some private supplies are very good. An important characteristic of supply is pressure. If water discharges from a faucet slowly it may mean clogged piping, piping too small, or low water pressure. If the house is new it would probably be the latter. If the pressure seems low, try to check it at the time of peak demand, which is usually between 7:00 A.M. and 8:00 A.M. Open faucets simultaneously on different floors and watch the one on the highest floor. If water discharges so fast that it splashes from the basin you may be sure that both piping and pressure are adequate. If necessary, the pressure can easily be reduced by the installation of a pressure-reducing valve.

There are two general systems of piping in a plumbing installation: (1) **supply pipes** that supply clean hot and cold water to the fixtures, and (2) **drainage pipes** that drain waste water and sanitary waste from the fixtures. Vent pipes are an important part of the drainage system.

Clean water in the supply pipes is forced to the fixtures under pressure; so small-size pipes are used. Copper or brass pipes indicate a quality job because of their resistance to corrosion. Galvanized-steel pipe is often used because it is less expensive, but during installation there is danger of exposing the steel. This will permit the steel to rust and ultimately discolor the water or clog the pipe. Black iron pipe should not be used for water supply lines.

Waste water in the drainage pipes is not under pressure but flows downward by gravity. This necessitates larger pipes with the main lines seldom less than two inches in diameter. Usually galvanized steel or iron pipe is used for the connection to the fixture and cast iron painted black for the larger pipes.

Drainage and supply pipes should be provided with cleanout plugs. These

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are screw plugs, removable with a wrench, that are usually placed where the pipe changes direction. Thus the pipes can be cleaned by the insertion of a flexible rod without dismantling the system. Plugs are often thoughtlessly omitted or intentionally omitted to save cost.

Examine all plumbing fixtures and check their condition. Fixtures are usually made of enameled cast iron or vitrified earthenware. Enameled cast iron is satisfactory for sinks, wash basins, bath and laundry tubs. Vitrified earthenware is preferable for water closets. When checking fixtures, look for cracks, stain, chipping, discoloration, wearing away of enamel, and small hairline cracks in the finish. Check faucets for leakage, wear, and defacement. An indication of thought and quality is the provision of a valve on the supply line to each fixture. This permits repairs to be made without shutting off service to other fixtures.

It is invariably necessary to have exposed piping under some fixtures. For convenience, cleanliness, and appearance this exposed piping should be chromium-plated brass and should pass into the wall rather than the floor.

Needless to say, there should be no leaks in the plumbing system. They are likely to occur at or near each fixture but may occur at any point. Do not, however, be deceived by the water that condenses on cold water pipes in warm, humid air. Remember, pipes that are installed in exposed locations such as near exterior doors and windows are subject to freezing in cold climates unless adequately protected.

### HEATING

The relative cost of heating systems is discussed in the following section and in judging a system it is safe to say that you will get what you pay for. Usually the system that involves the greatest initial cost will give the most satisfactory service with minimum attention. Each system can be improved by the installation of automatic controls and automatic firing and ash removal. The system and the fuel are matters of personal choice and experience.

The crucial tests from your standpoint as a buyer are whether the operation of the heating system has been satisfactory and whether the cost of operation has been within reason. In some houses it is extremely difficult to heat certain rooms. If the house has been occupied you can probably learn whether all rooms were adequately heated. Ask the owner but also ask his friends. The heating contractor who services the house can give you valuable information about the extent of repairs, the number of service calls, shutdowns, or failures of service. Find out if difficulties have been remedied. Obviously this cannot be done for a new house that has yet to weather a winter. If, in the case of a new house, you question the capacity of the heating system, you may require the owner to warrant that the system will heat all rooms to 70°F. when the outside temperature is at a specified low point depending upon the geographical location.

The cost of operation includes the cost of repairs or service, but most of it will be the cost of fuel. Poorly built and uninsulated houses cost more to heat than those that are well built and insulated. Cost may be influenced by the temperature you require in the rooms and the manner in which the system is operated, particularly if it is hand-fired fuel. The person or company selling fuel

can probably give you a more accurate statement of fuel consumption than the owner can. It will take only a few minutes to telephone them.

**Domestic hot water** is the hot water used for washing and laundering. It may be heated in conjunction with the house heating system, or heat may be supplied for it by a separate heating unit. If domestic hot water is heated by the house heating system during winter months, it is often necessary to have a separate system for hot water during summer months. Judge the system on the basis of year-round service.

Domestic hot water may be heated and stored in a tank until needed or it may be heated by an "instantaneous" heater which makes a storage tank unnecessary. In either case hot water should be available in adequate volume at all times. A 66-gal. tank is desirable. Anything smaller will probably not permit three hot baths nor will it permit a housewife to do the family wash, the baby wash, and bathe the baby all the same morning.

### OUTDOOR AREA

Before reaching a decision to buy, investigate not only the building but also all of the property. Check the presence and condition of all necessary walks and driveways. All should be properly drained and water should not stand in pockets. Ice will be hazardous in winter. Walks and drives, furthermore, should not be too steep for safe winter use.

Determine the need for retaining walls or, if they exist, examine their condition. If the area behind retaining walls is not drained by drain holes in the wall, the wall will fail through action of frost; the water freezes, expanding the earth with sufficient force to topple or crack a wall.

Be sure that there is sufficient topsoil for the lawn or garden. The minimum depth for a good lawn is 4 in. and for a garden, 12 in. Be certain that the slope of ground will drain surface water away from the building. This slope should be at least 6 in. in 10 ft.

Judge the condition of the lawn cover and check it for weed grass. If the house has been unoccupied for a period or has had careless maintenance, weed grass may be so prevalent that a new lawn is advisable.

The following check list is added to summarize and enumerate in usable form the many suggestions in this discussion. Its use will ensure a careful and complete examination of an existing house and may save you from expensive oversight or errors in judgment.

# BUYER'S CHECK LIST

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## HISTORY AND RECORDS

- When built
- Why built
- For whom
- Original cost
- Mortgages
- The contractors
- The architect
- Working drawings
- Specifications
- Occupancy

## BASEMENT

- Extent
- Headroom
- Subsoil drain
- Underfloor drain
- Floor drain
- Cleanouts
- Footings
- Condition of floor
- Evidence of water
- Condition of walls
- Wall cracks, bulging
- Leakage, stain
- Size and spacing of joists
- Presence of bridging
- Condition of girder
- Firestops
- Lumber defects
- Dry rot
- Termites
- Workmanship

## FLOORS

- Subflooring
- Building paper
- Type and condition of floors
- Linoleum, carpet
- Vibration, squeaks
- Workmanship

## CEILING AND WALL FINISH

- Flat, level, plumb
- Cracks

- Corner bead
- Condition of finish

## TRIM OR WOODWORK

- Type of wood
- Damage
- Condition
- Workmanship

## DOORS

- Warping and damage
- Thresholds
- Air leakage
- Weatherstrip
- Quality of hardware
- Screen doors
- Storm doors

## WINDOWS

- Type
- Lifts and locks
- Weatherstrip
- Counterweight
- Adjustable stops
- Sash-cord wear
- Rot, loose joints
- Leakage
- Shades
- Screens
- Storm sash

## STAIRS

- Vibration
- Squeaks
- Carriage
- Wear and damage
- Width and arrangement
- Lighting
- Safety
- Railings
- Head room

## ATTIC

- Rafter size
- Insulation
- Sagging or spreading

- Lumber defects
- Flooring
- Ventilation
- Leakage
- Workmanship
- Fire hazard

## ROOF

- Sheathing
- Type of covering
- Wear and damage
- Expected life

## ROOF DRAINAGE

- Type of gutter
- Type of hanger
- Downspouts
- Disposal of drainage
- Condition and damage

## EXTERIOR WALLS

- Type of wall
- Sheathing
- Type of finish
- Condition of wood
- Condition of masonry
- Furring
- Condition of paint
- Joint between types of walls

## CHIMNEY

- Thickness of brick
- Flue lining
- Foundation
- Flue size and cleanout
- Direct smoke connection
- Draft
- Fire hazard, charring

## FIREPLACE

- Real or ornamental
- Firebrick walls, floor
- Outer hearth
- Presence of dampet
- Ash dump and cleanout

## ELECTRIC WIRING

- Certificate of Inspection
- Type of wiring
- Condition
- Number and location of outlets
- Location of switches
- Fuses or circuit breaker
- Lighting fixtures

## PLUMBING

- Drainage of fixtures
- Venting

- Water supply
- Water pressure
- Type of supply pipe
- Type of drainage pipe
- Cleanouts
- Defects in fixtures
- Leakage
- Exposure to freezing

## HEATING

- Type of system
- Automatic controls

- Heat distribution
- Cost of operation
- Domestic hot water
- Capacity of storage tank

## OUTDOOR AREA

- Condition of walks
- Condition of driveway
- Retaining wall drainage
- Drainage of surface water
- Amount of topsoil
- Condition of lawn

# COST ANALYSIS

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RELATION OF MONEY TO SPACE AND QUALITY—GENERAL  
FACTORS INFLUENCING COST—MATERIALS AND LABOR—VARI-  
ATIONS IN BUILDING COSTS—SPECIFIC FACTORS INFLUENCING  
COST—EXPENSE IN ADDITION TO COST OF BUILDING—HOUSING  
COST—COST BREAKDOWN

**T**HE problem of cost has been of as much concern to home planners and home buyers as anything that can be mentioned. You have probably heard of cases in which the planning of a home had to be suspended or abandoned because of the belated discovery that the house was going to cost more than the owner had to spend. Most of these difficulties might have been avoided by more intelligent study of cost at the proper time.

Acquiring a home usually involves one of the largest financial transactions of a lifetime. The sum spent is often as much as two or three times a person's annual income. To spend this money wisely it is necessary that you have an understanding of the various elements entering into the cost of building.

It has previously been stated that a house should be planned to fit the needs of the family that is to occupy it. This means that the space requirement is usually known at the time planning begins.

**Cost** and **value** are two elements with which we are concerned in a study of the financial problems of home building and home ownership. It is important to have a well-defined understanding of each.

In this connection **cost** is the price you pay for your home. If you build, cost represents the labor and material entering into its construction.

**Value** is a variable factor which depends upon the needs of a prospective buyer and his desire for possession. It is dependent upon the utility of the house as much as upon its original cost.

## RELATION OF MONEY TO SPACE AND QUALITY

If you have an unlimited sum of money to spend for your house, you are not limited as to its quality, the manner in which it will be built, or the materials to be used in its construction. Few people enjoy these favorable circumstances. Usually you have a limited sum to spend. This means that you do not have complete freedom in the choice of all the elements of the building. It also means that you must study the entire problem and decide *wisely* just where to spend your money to the best advantage.

The fact that a large house costs more than a small one of similar construction and quality is self-evident. If you have a large sum of money to spend, you will be able to build a large house of good quality. If you have a relatively small sum, you may build one of equally good quality, but the size of the house must

be small. These two conditions are not likely to cause trouble or difficulty. However, people are frequently faced with the problem of getting a relatively large amount of space with only limited funds. In this case there are at least four possible solutions:

1. You may build or finish only a limited portion of your house at first—completing it at a later date when funds are available.
2. You may buy a house already built which is not new and therefore may cost less.
3. You may postpone your construction until sufficient funds are available.
4. You may reduce the unit cost of the house. This last solution is the one with which we are most often concerned because it will permit us to proceed with the construction of the building.

By **unit cost** is meant the average cost per unit of space. This is obtained by dividing the total cost of the house by its size. It may be expressed either in cost per cubic foot of volume or in cost per square foot of floor area. Unit cost can be reduced by building in a less expensive manner: by using less expensive materials, less expensive workmanship, or a combination of both.

**Material** and **labor** are the two basic elements of cost. The cost of material for a house represents from 55 to 65 per cent of the total. The balance, 35 to 45 per cent, is labor cost.

It is natural for us to associate materials with relative costs. We are in the habit of thinking of a brick or stone house as costing more than one built of wood. This principle is generally true. However, we should not lose sight of the fact that quality of materials and workmanship vary and thereby influence cost. Most of us, for example, when thinking of women's coats, think of a fur coat as costing more than a cloth coat. We all realize that this is not always true. A good cloth coat may cost more than a poor-quality fur coat. A cloth garment may be of higher quality than one of fur, both in material and tailoring. Likewise in building construction, we have good and poor quality of material and workmanship which influence cost.

Materials are usually specified by grade. Workmanship is also specified, but is less easily controlled. A brick wall costs more when built in a careful manner by a skilled workman than when built in a slipshod manner by an unskilled workman. Most of you know the difference between a piece of furniture built by a cabinetmaker and one built by a "wood butcher." The product of the cabinetmaker is worth more and commands a higher price.

To provide a fixed amount of space for a limited sum of money requires a careful and systematic plan of spending. This means that you must budget your expenditures.

In budgeting you must not only decide which elements are and are not to be included, but also the quality of material and workmanship to be used in their construction. As with a person, a house may have internal values that no one would suspect by a casual inspection of the exterior. On the other hand, the builder may have placed undue emphasis upon the creation of an impressive exterior



and neglected to build into the house the essentials required to make it a comfortable, healthful, and enjoyable place to live.

The principles of good planning have been presented and the importance of this part of the work can scarcely be overemphasized. Good planning is a fundamental requirement of a satisfactory house. Good materials and workmanship cannot, in themselves, ensure a satisfactory house. By illustration we may draw the comparison between a house and a suit of clothes. A suit may be made of excellent material, but if it does not fit the man who is to wear it, it possesses little direct value to him. A suit may be made of good material, represent excellent workmanship, be a perfect fit, and still be of limited value because its style is obsolete; the value of such a garment would be limited to its use as a theatrical costume or an antique. Similar tests of value are applied to a house.

After its shape, size, and general design have been established, materials and workmanship required to build it must be decided upon. This information is given on the plans or in the specifications. These establish the character of the building. It lies within the power of those charged with this work to mold the character of the building as they see fit. They can plan a building having sound qualities which will be a source of lasting satisfaction to its occupants, or they can "cut the quality" of the more practical elements in order to "dressup the exterior."

Naturally you do not want to leave out all elements that will add to the beauty of the building. You should, however, place first in importance those things which are necessary in providing for comfort, health, safety, and convenience. Beauty is not necessarily something that is added to a building like an extra room. A house may provide only for the essentials and still be attractive. Whatever is simple, functional, and straightforward in design is frequently pleasing and attractive in appearance too.

If you are to get full satisfaction from your home, you must either have an understanding of all the elements entering into the building problem yourself, or must entrust this work to someone who is trained to advise you or do it for you. If you need such help, you ought to see that the man doing the work understands your problem, your likes, dislikes, and special desires. The architect is specially qualified to carry out that work. Regardless of whether or not you employ an architect, you will need to secure information regarding costs of materials and construction. For this information we are usually indebted to the contractor and building-materials dealer. These men can best supply you with detailed cost information because that is their business. They are familiar with local conditions and other factors influencing cost.

The costs of materials and types of construction will represent initial or first costs. Almost everyone is familiar with the fact that what is cheapest in the first cost is not always the least expensive in the long run. Many people think they are saving by buying an article that is priced lower than another without considering which will be least expensive over a period of time.

In this chapter we are particularly concerned with the cost of the house. The factors influencing this cost may be placed in two classifications; those factors of a general and those of a specific nature. In order to avail ourselves of the

advantage in savings in cost made possible by the general factors, it is necessary to consider them from the very outset of the planning program. Because of this, the general factors will be considered first. Attention will be given to the specific factors later.

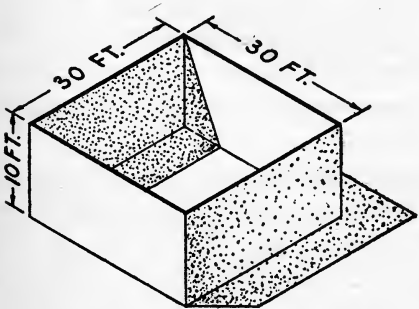
## GENERAL FACTORS INFLUENCING COST

**The nature of the building site** influences the cost of the building. This fact has been called to your attention in a previous chapter. If subsurface soil conditions are unfavorable, the cost of the building will be increased. It is more expensive to excavate in rock than in ordinary soil. The presence of water will also add to the expense of excavation. If the surface of the ground is irregular, requiring extensive grading and retaining walls, the cost will be increased. If any or all of the usual public utilities and services are not available, the cost will be increased. If you must provide your own private water supply or sewage disposal, additional expense will be incurred.

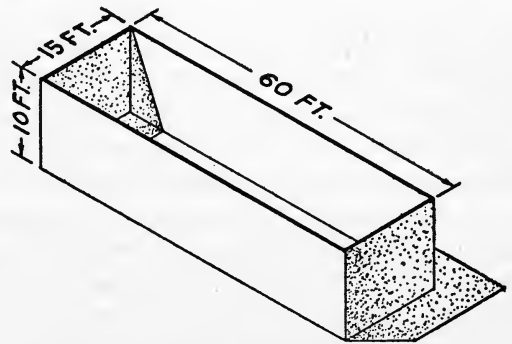
**The season of the year** in which a building is erected will affect the cost. With modern methods you may build your house at any time of year, but the provisions that must be made when building in winter usually increase cost. It may cost twice as much to excavate frozen ground as that not frozen. Other divisions of the construction operations may prove more expensive when done during severe winter weather.

**The general nature and type of the building** may influence its cost. A simple, compact, regular building can be built for less than one that has a rambling plan—is irregular and contains complicated details. If a house is to have more than five rooms, a two-story plan will usually prove more economical than a one-story plan. A rambling house has many desirable qualities, but is not so economical to build as one that is compact and square. This is true because the rambling house has more wall area for an equal amount of floor area.

The comparison can be easily seen by a simple illustration. The illustration which follows shows the plan of two buildings which have equal floor areas. The rectangular house requires  $1\frac{1}{4}$  times as much outside wall to enclose the same amount of space as the square house.



FLOOR AREA — 900 SQ. FEET  
WALL AREA — 1200 SQ. FEET



FLOOR AREA — 900 SQ. FEET  
WALL AREA — 1500 SQ. FEET

This principle applies also to houses having irregularly shaped plans. Of course not everyone wants to build a square house, but it is well to know that a

building with a low ratio of wall area to floor area is more economical than one having a high ratio of these areas.

In the consideration of planning, your attention was called to the need for space in the house for equipment frequently located in a **basement**—heating system, laundry, garden and yard tools, children's bicycles, wagons, and the like. Space must be provided for these items. Some of them can be more conveniently located on the first-floor level. All must be provided for either above or below ground. Which will cost the more? Best construction practices require that we carry foundations deep enough to avoid the detrimental effects of frost. This is true regardless of whether we do or do not have a basement. In northern states this means that the foundations for a house without a basement must usually be carried about half as deep as for one with a basement. If ordinary soil conditions exist, basement space can be created for less cost than similar space above ground. In fact, the cheapest pre-fabricated shed cannot be obtained for much less than it costs to provide this type of space in the basement.

## MATERIALS AND LABOR

Materials and workmanship have previously been mentioned and illustrations have been given to show their influence on cost. Savings in cost can usually be made by a judicious **selection of materials**. Some materials are more readily available than others and possess local price advantages. If you are building in a location where lumber is locally available and the price is low, it would be wise to take advantage of this condition. You would gain by reason of price and also from the advantage of prompt delivery service.

Availability of labor may influence both the design and the cost of a building. If a greater supply of skilled labor is required to build a home than is available locally, the cost of the building may be increased. Local labor conditions may influence the cost. Some localities have a higher labor wage scale than others. Some localities have union workmen; others do not.

Savings in cost can sometimes be made by using materials and types of construction that conform to **local building practices and skills**. If you insist upon building a home with materials uncommon to the locality, or methods unfamiliar to the local tradesmen, you may find it necessary to do one of two things. You may either import tradesmen, at additional expense, who are familiar with the particular type of construction or material; or you may choose to educate the local tradesmen to do the work. In the latter case, your home will have to serve as the guinea pig in the educational process, a procedure of questionable advisability. In either case, added expense will be incurred.

It should not be necessary to point out that a workman can do better when working with materials and methods that he has used and knows, than when experimenting with materials and methods that are unfamiliar to him. A chef may require only a cookbook to prepare a dish with which he has had no previous experience, but the quality of that dish is not likely to be so good as one that he has been preparing for years.

The cost of a building depends to a considerable extent upon the **ability of the builder** to organize his work systematically and efficiently. Delays, lost

time, and conflicts in the various divisions of the work result from poor management. These are costly to the owner as well as to the contractor. A good contractor can oftentimes save in cost of materials by shrewd and careful buying. Efficient contractors usually have lower operating costs and general overhead expenses. A contractor with a good financial standing can buy materials for less than one with a poor financial standing. These savings in cost may be reflected in the cost the owner must pay.

In planning a house people often think that the total cost will be in direct proportion to its **size**. They reason that if two houses similar in all respects are built at the same place and at the same time, their costs will be in exact ratio to their size. If one is twice as large as the other, its cost will be twice as much. This is not true. As a matter of fact, the large house can usually be built at a unit cost considerably less than the smaller house. There are several reasons for this.

First, the cost of a number of important items in a house does not vary directly with the size of the house. For example, a six-room house of 30,000 cu. ft. volume might have the same number of bathrooms and fixtures as a six-room house which is only two-thirds as large. The actual plumbing cost might be nearly the same for each house. A similar condition would hold true for the cost of electrical work. The number of outlets, switches, and number of fixtures, might be the same in the two houses. The difference in their cost usually will not vary in direct proportion to the size of the houses. Other parts of a house further illustrate this point—stairways, chimney, and fireplace, for example.

The second reason why a large house can frequently be built for a lower unit cost than a small house is that certain items of expense in the construction operations are about the same regardless of size. The larger the house, the smaller will be the proportion of these expenses to total cost. For example, in excavating for a basement, it costs as much to take the power shovel to and from the site of a small building as to a large one. This condition occurs in many of the other divisions of work.

Everyone is aware of the saving in production costs made possible by **machines**. A knitting machine can knit a sweater for lower cost than you can do it by hand. This also applies to houses and the elements of which they are built.

We can save by using, wherever possible, **factory-built or prefabricated elements**. One of the reasons why factory-made units cost less is that factories avail themselves of the advantages of mass-production methods. You may effect savings in building cost by using manufactured units and still retain the individuality of a home specially designed for your particular needs.

The savings made possible by mass-production methods may be made use of in still other ways. **Group housing programs** are an example. It is easy to see that two or more houses can be built at the same time and place by the same builder for less cost per house than for a single house built alone.

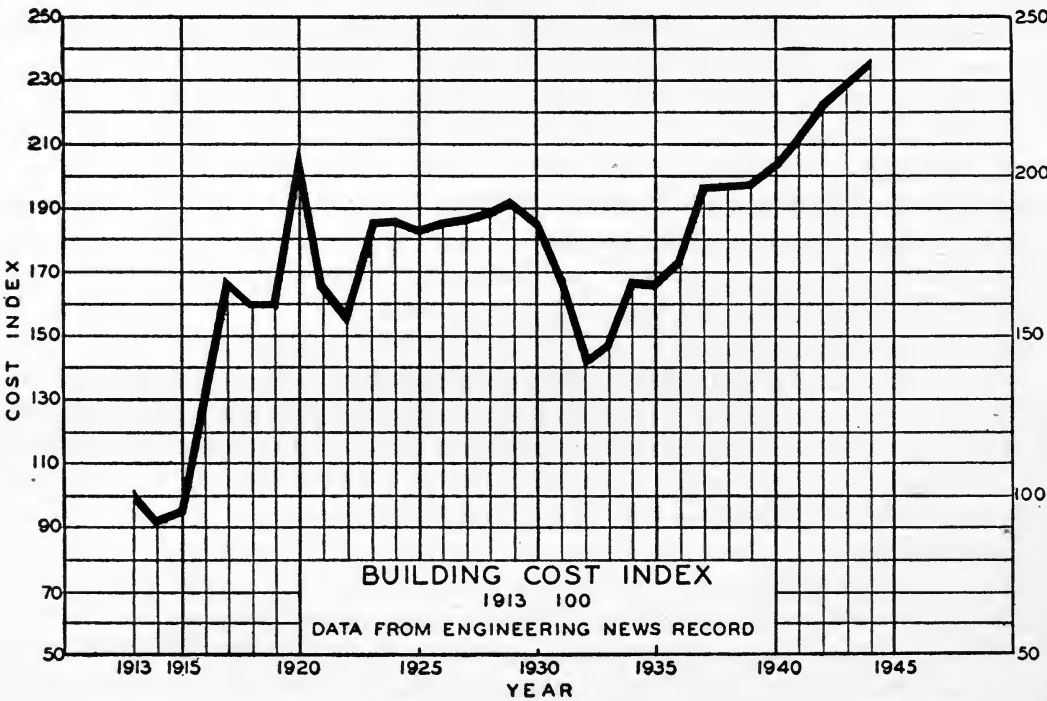
#### VARIATIONS IN BUILDING COSTS

In popular magazines you frequently see houses illustrated with a statement of cost. Sometimes total cost is given—\$8,000 for example. Sometimes the unit cost is given—35 cents per cubic foot, or \$2.50 per sq foot. Do not misinterpret

# COST ANALYSIS

these costs. Do not jump to the conclusion that you will be able to reproduce that house in your own locality for the same cost. Costs vary in **different localities**. This is due principally to the fact that at any given time the costs of material and labor vary from place to place. At this particular time, common labor is paid almost twice as much in one of our large cities as it is in another. The cost of lumber in one of our large Eastern cities is almost twice as much as it is in one of the large cities of the South. The cost of common brick in one location is about one and three quarters times as much as it is in another. Building construction costs are affected accordingly.

Costs of labor and materials vary with **time**. You are forcefully reminded of this whenever you go into a store today. The chart shown indicates the general trend in average building costs over the United States for the past thirty years. You will observe that the cost of construction in 1944 was higher than at any other time in the history of our country: that it cost more than one and one-half times as much to build in 1944 as it did in 1932. This means that a house built for \$6,000 in 1932 would cost about \$9,000 in 1944. The chart shows that the sum spent by your parents in building your childhood home provided a house two to three times as large as could be built today for the same sum of money.



## SPECIFIC FACTORS INFLUENCING COST

A brief study of the general factors just considered reveals the large number of variables entering into the problem of cost. The difficulty of approaching this second division of our problem is evident from a study of the general factors. The planning and cost analysis of every house is more or less a separate problem in itself. If an analysis were to be made using dollars-and-cents values it would

be applicable for only one house built at a given location at a given date. Because of these facts it is preferable here to analyze the cost elements in percentages rather than in dollars and cents.

In this study a common type of house is selected upon which costs of the various parts have been determined and expressed in percentage figures. This method provides us with relative cost values which may be applied to any similar building for which the total cost is known or estimated. The total cost, estimated from price and building-cost information known to apply to the particular locality at a given date, may be determined by questioning qualified persons in the community—architects, contractors, and building-materials dealers.

Cost information presented in the following manner gives you an understanding of the relative costs and values of the various divisions of the house. It enables you to see in advance what changes in total cost may be expected to result from changes in selection of materials or methods of construction. For example, you can quickly determine the approximate difference in cost between a house built with brick-veneer walls, and one of the same size built with any one of the other types of wall construction listed. It enables you to see how much more a slate roof may cost than one built of wood shingles—or how much the total cost may be reduced by changing from a steam heating system to one of a different type. In this cost study, consideration has been limited to a number of the more common materials and methods of construction.

The house used as a basis of this study has two stories and seven rooms with a basement under the entire house. There are four bedrooms, two bathrooms, and one lavatory. There is one fireplace. The plan is rectangular in shape; dimensions 23 by 38 ft; volume 27,500 cu. ft. The roof is the plain gable type. There are no dormer windows or any irregularities of construction. We shall consider the house and its construction divided into parts familiar to us all—walls, floors, roof, etc.

In studying each of these divisions we consider a number of different conditions and types of construction. These will cause a change in cost, as well as percentage; the cost of each type is given. The mean between the lowest and highest figures is used to represent the average cost of the building. For example, the **average** cost of the walls is  $17\frac{1}{2}$  per cent of the entire building. If you choose a wall construction costing more or less than this amount, the entire cost of the building will be increased or decreased accordingly. If 20 per cent is spent for walls, the total cost of the building will be increased the difference between  $17\frac{1}{2}$  per cent and 20 per cent, or  $2\frac{1}{2}$  per cent. In other terms, \$250 will be added to a \$10,000 house. If average elements are chosen throughout, the building will total 100 per cent. It may cost more or less than this average figure, depending upon the materials and types of construction chosen and specified.

A summary of costs for the house follows. It can be seen from this table that the total cost of the building may be changed approximately 25 per cent, or one quarter, higher or lower than the average cost by choice of materials and methods of construction. This means that a house having an average cost of \$10,000 may be reduced to \$7,500 or increased to \$12,500 by selection of the elements entering into its construction.



# COST ANALYSIS

Cost Summary				
	Mean %	Variation %	\$10,000 House	Variation \$
1. Excavation	1½	± 1	\$ 150	± \$100
2. Foundation and basement walls	6½	± 1¼	650	± 125
3. Walls	17½	± 6	1,750	± 600
4. Floors	12	± 1	1,200	± 100
5. Roof	7½	± 1¾	750	± 175
6. Windows, doors, misc. woodwork, mechanical equipment	21¼	± 4¾	2,125	± 475
7. Plumbing	10¾	± 3	1,075	± 300
8. Heating	8	± 3	800	± 300
9. Electrical	5	± 1	500	± 100
10. Contractor's cost	10	± 3	1,000	± 300
<b>Cost of building</b>	<b>100</b>	<b>± 25¾</b>	<b>\$10,000</b>	<b>± \$2,575</b>

## ITEMS OF EXPENSE IN ADDITION TO COST OF THE BUILDING

In the cost data which follows, we are principally interested in the cost of the building itself. You are cautioned not to confuse the cost of the building with the total development cost. In addition to the cost of the building a number of items of cost will be required to develop the property fully and place it in condition for occupancy. These include cost of land, financing costs, furnishings, landscaping, walls, drives, finish grading and seeding. The cost of these items may vary widely. An approximate range of costs follows:

<b>Land</b>	8 to 12 per cent
<b>Construction financing</b> (including interest, insurance, attorney's fees, bond)	1 to 2 per cent
<b>Furnishings</b> (including kitchen range, refrigerator, and window shades)	3 to 5 per cent
<b>Landscaping</b> (including finish grading, seeding, plant material, walks and drives)	3 to 4 per cent
<b>Professional Service Fees</b> (including architect's and engineer's fees)	5 to 7 per cent
<b>Average total</b>	<b>25 per cent</b>

The total of these additional items averages 25 per cent of the total cost of the building. This means that when all costs are considered, the sum required for total development will be 1¼ times as much as the cost of the building alone. If the building cost \$10,000, \$2,500 additional will be needed to place the house in condition for occupancy. A total sum of \$12,500 is needed for a \$10,000 building.

## HOUSING COST

There is a still larger problem of costs which goes beyond those mentioned. It may be called housing cost. This includes items of maintenance and repair



which occur over a period of time, under which may be mentioned insurance, heating, utilities, painting and general repair, depreciation and obsolescence.

Detailed consideration is now to be given each division of the building. All percentage values are in terms of percentage of the cost of the building. Following many of the percentage values, a cash value is given which represents the percentage applied to a \$10,000 house. For a house of any other total cost, the specific cost can be approximated by assuming it to be in direct proportion.

### COST BREAKDOWN

EXCAVATION —  $\frac{1}{2}\%$  to  $2\frac{1}{2}\%$

THIS BLOCK REPRESENTS THE COST OF THE BUILDING

First consider excavation or the digging required to build the foundations and basement of the house. This item may cost, under normal conditions, from  $\frac{1}{2}$  to  $2\frac{1}{2}$  per cent of the entire cost of the building. In terms of a \$10,000 house this would mean a variation of \$50 to \$250. This variation may be caused by any one or a combination of the following conditions:

Quantity and type of excavation.

Nature and condition of the soil.

Disposal of excavated material.

Method of excavation.

**Quantity and type of excavation** is an elementary factor of great importance and should be thoroughly understood. Quantity of excavation will depend upon whether or not the house has a basement and the size of the house. It also depends upon the depth of the footings and basement below the existing grade. If the building is to have no basement, trenches will have to be dug by pick and shovel, a type of digging that is slower and costs more per cubic yard than general basement excavation.

Some houses are built with the first floor a greater distance above the ground than others. It may be noticed that some houses are built so far out of the ground that the basement windows are entirely above grade. Others are built so that the basement windows are entirely below the surface of the ground, requiring the use of areaways. It should be evident that these extremes involve different quantities of excavation. As a result there is a corresponding difference in cost.

**Nature and condition of soil** influence cost of excavation. Ordinary medium soil can be removed faster and at less cost than rock. If rock must be blasted for removal, cost of excavation may be increased as much as four times the cost for ordinary soil. This could increase the cost of excavation to as much as 4 per cent—double the limit here considered. Condition of soil may also affect the cost of excavation. Frozen material may cost twice as much to remove as ordinary material. The presence of water will also add to cost.

**Disposal of excavated material** influences cost of excavation. If material can be used on the site for grading, the cost of the entire procedure will be reduced. If it must be loaded into a truck and transported a considerable distance, cost will be increased.

**Method of excavation** influences cost. If excavation is of a type and size

# COST ANALYSIS

that will permit the use of a power shovel, work can be done at considerably less unit cost than when done by hand or by scraper. Types of excavation involving trenches and pits must be done by hand, which is much more expensive.

If the excavation for a \$10,000 house is to be done for  $\frac{1}{2}$  per cent, or \$50 (the lower limit), most favorable conditions must exist—open type of foundation of shallow depth, soil of a type easily excavated, mild weather conditions, and availability of power equipment (either scraper or shovel). Cost may be increased to  $2\frac{1}{2}$  per cent, or \$250, by adverse conditions.

FOUNDATIONS & BASEMENT WALLS	$5\frac{1}{4}\%$ to $7\frac{3}{4}\%$	
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This division of the work includes footing, foundations, and basement walls. On the basis of a \$10,000 building this work will cost \$525 to \$775.

The three materials most commonly used in building basement walls are concrete block, native stone, and poured concrete. All of these materials are well suited for this use. Their value and quality will depend upon the grade, quality, and workmanship of the various elements entering into their construction.

## Concrete Block: $5\frac{1}{4}$ to $5\frac{3}{4}$ per cent (\$525 to \$575)

Walls built of concrete block usually cost less than when built of either stone or poured concrete. The quality of anything made of concrete depends upon the proportions of the ingredients and the workmanship used in the construction operations. Concrete blocks are manufactured locally in most communities.

## Stone (variable)

In locations where good-quality stone is plentiful and available at low cost, it is frequently used for building basement walls. It is usually somewhat more expensive than concrete block and less expensive than poured concrete. The cost of walls built of stone varies so widely with conditions at different locations that no specific cost can be applied to them with any degree of dependability.

## Poured Concrete: $6\frac{3}{4}$ to $7\frac{3}{4}$ per cent (\$675 to \$775)

Poured concrete is a very satisfactory material for building basement walls and is quite commonly used. Walls built of good-quality concrete with good workmanship usually cost more than comparable walls of either concrete block or stone. Since forms that serve as molds are required for anything built of poured concrete, the cost of these forms constitutes a considerable part of the total cost of poured-concrete work. The cost of walls built of poured concrete will depend upon the mix or proportions of the concrete and the quality and workmanship of the formwork, mixing, finishing, etc.

It is desirable to use poured concrete footings for basement walls regardless of whether they are built of concrete block, stone, or poured concrete. This type of footing has been included in the estimated costs previously given.

A number of items of added expense are frequently found necessary in connection with basement walls. If walls require dampproofing, this material will add between  $\frac{1}{3}$  and  $\frac{1}{2}$  per cent to the cost. If drain tile are placed around the footings of the building, between  $\frac{1}{3}$  and  $\frac{2}{3}$  per cent will be added. Waterproofing, not included in the percentages given above, is expensive and may add 2 to 3 per cent to the cost of the building.

It is very important to know the difference between the terms dampproofing and waterproofing. Dampproofing, as the term implies, is a provision to reduce or prevent dampness from passing through a wall. The most common type consists of one or more coatings of bituminous or asphaltic paint applied by brush to the outside surface of the wall. This treatment is neither suited nor intended to be used for preventing water from passing through a wall.

Waterproofing is a provision for preventing water from passing through a wall. One of the most common types of waterproofing consists of applying layers of waterproof felt or fabric membrane to the surface of the wall. This material is applied by mopping between layers with asphalt or composition in a manner similar to that used in building a composition or built-up roof.

WALLS (ABOVE GRADE) 12% to 24%



This division of the building includes interior walls or partitions as well as outside or exterior walls. It includes all materials entering into their construction except windows and doors which are classified elsewhere. On the basis of a \$10,000 building these will cost \$1,200 to \$2,400. In this study all interior partitions are considered to be built of wood frame—2- by 4-in. vertical studs spaced 16 in. on centers. Where exterior walls are described as wood frame they are built of 2- by 4-in. vertical studs spaced 16 in. on centers.

Of the many types of outside or exterior walls, nine of the more common were selected for purposes of this study. These will be considered in the order of their cost.

Interior finish of all walls listed below is three-coat plaster applied on gypsum lath. If two-coat plaster is used, the cost of walls will be reduced by approximately  $\frac{1}{3}$  to  $\frac{1}{3}$  per cent. The cost of interior walls or partitions is about  $5\frac{1}{4}$  per cent of the total cost of the house. This is included in the percentages given below. The cost of exterior wood frame walls with wood sheathing but exclusive of the facing or finishing material is about  $5\frac{3}{4}$  per cent.

In the costs of walls listed, no insulation has been included. If any of the first eight walls are insulated with 3-in. thickness of mineral wool, from 1 to 2 per cent will be added to the costs given.

1. **Asphalt Shingle Exterior** (wood frame with sheathing): 12 to 13 per cent (\$1,200 to \$1,300)

This wall is the least expensive of those considered. It is often used on low-cost houses where extreme economy is necessary. Wood sheathing is used in this wall.

## COST ANALYSIS

2. **Stucco Exterior** (wood frame without sheathing): 12 to 13 per cent (\$1,200 to \$1,300)

This wall has a facing of Portland cement stucco applied over a paper-backed metal lath. No sheathing is used.

3. **Wood Shingle Exterior** (wood frame with sheathing):  $12\frac{1}{2}$  to  $13\frac{1}{2}$  per cent (\$1,250 to \$1,350)

This wall is considered to be built of common cedar shingles of the size most commonly used for roofs of low-cost houses. These shingles should not be confused with the heavy, hand-hewn type. The lower cost of the range given applies to unpainted shingles. The higher cost provides for a three-coat painted finish.

4. **Stucco Exterior** (wood frame with sheathing): 13 to 14 per cent (\$1,300 to \$1,400)

5. **Asbestos-shingle Exterior** (wood frame with sheathing):  $13\frac{1}{2}$  to  $15\frac{1}{2}$  per cent (\$1,350 to \$1,550)

6. **Wood-clapboard Exterior** (wood frame with sheathing):  $13\frac{3}{4}$  to  $14\frac{3}{4}$  per cent (\$1,375 to \$1,475)

The cost of this wall includes a three-coat painted exterior finish.

7. **Brick Veneer** (wood frame with sheathing): 18 to 19 per cent (\$1,800 to \$1,900)

8. **Native Stone Facing** (Wood frame with sheathing): 18 to 19 per cent (\$1,800 to \$1,900)

This wall is faced with local stone applied as a veneer. In favorable locations this wall will cost about the same as Wall Number 7.

9. **Brick and Tile Wall** (all-masonry construction): 22 to 24 per cent (\$2,200 to \$2,400)

This wall is built entirely of masonry. The outside surface of the wall is face brick with 8-in. hollow-tile backing, making a wall about one foot in thickness.

FLOORS ———  $11\%$  to  $13\%$



This division of the building includes all material entering into construction of basement floor, first floor, and second floor. These will cost \$1,100 to \$1,300 for a \$10,000 building. In this study first and second floors are considered to be built of wood frame construction using 2 by 10 in. joists spaced 16 inches on centers. Basement floor is built of poured concrete. The finish floors in first and second stories are of wood except in kitchen, bathrooms, and entrance halls where linoleum is used.

Two combinations of floor construction are considered in the cost analysis:

1. **Basement**— $3\frac{1}{2}$ -in. concrete slab on earth. **1st and 2d Floors**—oak flooring without subfloor, gypsum lath, two-coat plaster ceiling.
2. **Basement**—4-in. concrete slab on cinder fill. **1st and 2d Floors**—pine subfloor, oak-finish floor, gypsum lath, three-coat plaster ceiling.

Savings may be made in the cost of floor joist by making the rooms of sizes which will use stock lengths of lumber to greatest advantage. The saving in this connection would be from  $\frac{1}{3}$  to  $\frac{2}{3}$  per cent of the total cost of the house.

ROOF —————  $5\frac{3}{4}\%$  to  $9\frac{1}{4}\%$

This division of the building includes all framing and finishing materials required in the construction of the roof and the ceiling of the second story. In addition, all auxiliary materials incident to the roof are included, such as finish millwork of eaves and cornices, gutters, downspouts, and flashings.

The cost of the roof for a \$10,000 building will be \$575 to \$925.

Four common types of roofs are included in this study. Wood frame construction was assumed in all cases. All the roofs have wood sheathing except the wood shingle roof which has shingle strips or lath. Gutters and downspouts made of galvanized sheet metal were included in the estimate. In the basic estimate all the roofs were assumed to have no insulation. The cost of all materials of the roof exclusive of sheathing and finish roof covering is about 4 per cent; the cost of wood roof sheathing is somewhat less than 1 per cent.

If copper gutters, downspouts, and flashings are used, about  $\frac{1}{3}$  to  $\frac{2}{3}$  per cent will be added to the cost given below. If 3 in. of mineral-wool insulation is used, about  $\frac{1}{4}$  to  $\frac{1}{2}$  per cent will be added to the total cost. There is a wide range in grade and quality of roofing materials. This is reflected in a correspondingly large range in costs and has been provided for by giving costs in range figures.

1. **Wood Shingles:**  $5\frac{3}{4}$  to  $6\frac{1}{4}$  per cent (\$575 to \$625).
2. **Asphalt Shingles:** (sometimes called composition shingles)  $5\frac{3}{4}$  to  $6\frac{1}{4}$  per cent (\$575 to \$625).
3. **Asbestos Shingles:** 7 to  $7\frac{1}{2}$  per cent (\$700 to \$750).
4. **Slate Shingles:**  $7\frac{1}{4}$  to  $8\frac{1}{4}$  per cent (\$725 to \$825).

There is an extremely large range in quality and cost of slate. The upper limit given above was restricted to the type ordinarily used on houses of moderate cost.

WINDOWS·DOORS —————  $16\frac{1}{2}\%$  to  $26\%$    
MISC. WOODWORK

This division of the building includes windows, doors, trim around windows and doors, window screens, screen doors, cabinets, kitchen cabinets, linen cases, storage cases, and shelving, all finish hardware, and the painting or finishing of these items. This will cost \$1,650 to \$2,600 for a \$10,000 building. The cost of windows alone will vary from 6 to 9 per cent (\$600 to \$900). The doors will cost from 6 to  $10\frac{1}{2}$  per cent, depending upon material, quality, and finish. The cost of finish hardware will range between  $1\frac{1}{2}$  and  $2\frac{1}{2}$  per cent.

The cost of three basic combinations of elements has been estimated and

# COST ANALYSIS

listed. From these three, many other combinations are possible by adding any or all of the supplementary items listed below the table. the sheet.

A. 1. <b>Windows</b> —wood, double-hung type (low-cost) assem- bled and fit at job	} Cost 16½ to 18 per cent \$1,650 to \$1,800
2. <b>Doors</b> —softwood, painted finish	
3. <b>Window Screens</b> and screen doors—galvanized wire	
4. <b>Hardware</b> —average quality—2 per cent	
5. <b>Kitchen Cabinets</b> —wood, painted finish	
B. 1. <b>Windows</b> —wood, double-hung type, pre-fit and weather-stripped Items 2 to 5 same as in Combination A	} Cost 19 to 20½ per cent \$1,900 to \$2,050
C. 1. <b>Windows</b> —steel, casement type (medium quality) Items 2 to 5 same as in Combination A	
	} Cost 20 to 21 per cent \$2,000 to \$2,100

## Supplementary Items

1. Hardwood doors and trim	3 to 4 per cent additional
2. Steel kitchen cabinets (medium quality)	¼ to 1 per cent additional
3. Copper or bronze window screens and screen doors	⅓ to ⅔ per cent additional
4. Hardware of more select quality	⅓ to ⅔ per cent additional
Total average (approx.)	5 per cent additional

PLUMBING ——— 7¾% to 13¾% 

This division of the building includes sewer and water service lines, storm-water drainage lines, water distribution lines, sanitary waste lines, plumbing fixtures, hot-water storage tank, and water heater. The costs given are based on a plumbing system connected to a public sewer and public water supply. Plumbing for a \$10,000 building will cost \$775 to \$1,375.

## Service and Drainage Lines and Rough Plumbing: 4 to 4½ per cent (\$400 to \$450)

In this subdivision are included water distribution lines, waste and drain lines inside building, water service line to house, connection of house sewer to public sewer, and storm-water drainage lines for disposal of rain water from roof. For a house one-half the size of the one used in this analysis it is possible that the cost of this division of plumbing may run from 1 to 1½ per cent higher than the values given above.

## Fixtures: 3½ to 7¼ per cent (\$350 to \$725)

Under this subdivision are included lavatories, water closets, bath tubs, kitchen sink, and laundry tub. The wide variation in cost of plumbing fixtures is responsible for a large part of the variation in the total cost of plumbing. We have on one extreme the cheapest type of fixtures fulfilling only minimum require-




ments. On the other extreme we have expensive fixtures obtainable in a range of colored finishes. These not only perform their function in a highly desirable manner, but are beautiful and durable as well. The cost values given do not include extremes, but are chosen to represent the cost of moderate-priced fixtures commonly used in houses of the type being studied.

## Hot-water Storage Tank and Heater: $\frac{1}{3}$ to 2 per cent (\$33 to \$200)

The least expensive hot-water heater considered here is the hand-fired, coal-burning type with a galvanized steel tank. The most expensive type is an automatic gas or electric heater with integral tank of rustproof material.

## Additional Costs

As was stated at the beginning, the costs given are based on public water and sewage-disposal service. If a private sewage-disposal system is required, from  $\frac{1}{2}$  to 1 per cent will be added to the cost, depending upon the type installed.

HEATING ——— 5 % to 11 % 

This division of the house includes all equipment required for heating. Heating for a \$10,000 building will cost \$500 to \$1,100. Three principal types of heating systems have been considered in this division: warm air heating, steam heating, and hot-water heating. As the names imply, the sources of heat are, respectively, heated air, steam, and heated water. The cost figures given are based on hand-fired coal-burning equipment. If oil-burning equipment is used, the cost will be increased approximately  $1\frac{1}{2}$  to  $2\frac{1}{2}$  per cent. The installation of a mechanical stoker will also add to the cost given above.

## Warm-air Heating System: 5 to 7 per cent (\$500 to \$700)

This type of heating employs a furnace as a means of heating air which is used to heat the rooms. The heated air is conducted to the rooms by a system of sheet-metal ducts. The air enters the various rooms through registers or grilles. In some instances the circulation of the warm air is secured by gravity. In other installations an electrically driven fan is used to circulate the air. These two types of warm-air heating systems account for the variation in cost.

## Steam Heating System: 7 to 9 per cent (\$700 to \$900)

There are many types of steam heating systems. The type considered here is called a "one-pipe system," so-called because one single pipe is used to conduct steam from the source, which is a boiler, to the radiators located in the various rooms. This one pipe carries both steam and condensate (water), which runs out of the radiator through the same pipe, when the steam is cooled and condensed by contact with the radiator. Some steam heating systems employ two pipes—one to carry steam, the other to carry condensate. This type of system would cost from  $1\frac{1}{2}$  to 2 per cent more than the one-pipe system for which costs are given.



# COST ANALYSIS

## Hot-water Heating System: 9 to 11 per cent (\$900 to \$1,100)

A hot-water heating system uses water as a medium for transferring heat. Water is heated in a heater similar, in most respects, to a steam boiler and is conducted through a system of pipes to hot-water radiators located in the rooms. In this type of heating we have one-pipe and two-pipe systems in a manner similar to that in steam heating. We have two means of circulating the hot water. One type of system depends upon gravity, or the difference in the weight of water of different temperature, for circulation. The other type uses a small electrically driven water pump to circulate the water. In the latter system smaller pipes may be used than in the gravity system. This influences cost accordingly.

ELECTRICAL — 4 % to 6 % 

This division of the house includes all lines and accessories required to bring electrical service to the house and distribute it to the various locations at which it is to be used. This includes electrical distribution lines inside the building and lighting fixtures. The type of wiring considered in this estimate is flexible armored cable, commonly referred to as BX.

This electrical work will cost \$400 to \$600 for a \$10,000 building.

The rough wiring will cost approximately 2½ to 3 per cent.

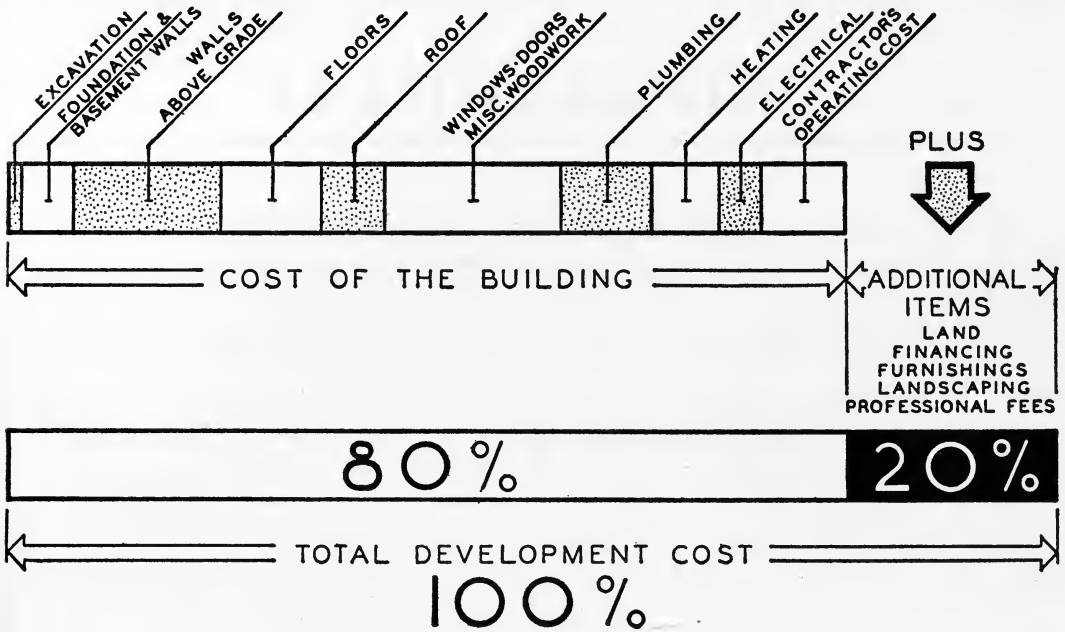
The cost of lighting fixtures will vary from about 1½ to 3 per cent, depending upon the type and quality of fixtures selected.

CONTRACTOR'S  
OPERATING COST 7 % to 13 % 

This item of cost is sometimes referred to as "contractor's overhead and profit." It really is the contractor's cost in overseeing and managing the entire construction operations. It has been mentioned in the first part of this chapter that some contractors can do their work for less cost than others. This entire amount could have been distributed among and included in each of the previous divisions. However, it is a definite item of cost that must be borne by the owner, regardless of where it is included. It appears more desirable to list construction cost separately. The construction costs for a \$10,000 building will be \$700 to \$1,300.

## SUMMARY

The following charts indicate graphically the relative costs of the various parts of the building. Your attention is again called to the fact that the cost of the building is not the total sum required for the development of the property. The various items of the cost necessary in addition to the cost of the building have been enumerated. The lower chart shows the cost of the building to be approximately four-fifths (or eighty per cent) of the total development cost. The other one-fifth (or twenty per cent) represents the cost of the additional items.



## If you are planning to build your own home:

1. Seek expert advice upon building costs early in your planning program.
2. Remember that the cost of the building is only about four-fifths (80 per cent) of the total cost of the developed property.
3. Keep in mind the fact that "first cost is not last cost."
4. Choose materials and types of construction whose costs are in proportion to the total amount you intend to spend. If you insist upon extravagant items, be willing to sacrifice on some other items in order to balance their cost.
5. Where extreme economy is necessary, reduce on all items.

## If you are planning to buy your home:

1. Seek expert advice from a neutral or disinterested party.
2. Make a complete inspection. In doing this, make a written summary or check list of all elements of the property, noting the undesirable features as well as the desirable ones.
3. Keep in mind the fact that "first cost is not last cost."
4. Make a list of all changes and repairs which you consider will be necessary to place the property in condition suitable for your occupancy. Secure an estimate of the cost of making these changes and repairs.

# THE ARCHITECT

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**A**n architect is a master builder. His professional skill and knowledge as business administrator, planner, and supervisor of construction are offered to those who are unacquainted with the problems of building and who consequently need guidance in the wise investment and protection of their money.

The privilege to practice as a registered architect is granted by a state board of examiners only to those who are qualified by education and experience to exercise the skill and judgment necessary to protect public health and safety.

As agent of the owner, an architect translates your wishes and ideas into a tangible description of the building and accordingly executes working drawings and specifications to govern the work. His experience is also available to you in the selection of reputable contractors. To ensure that all contractors bid on identical information he prepares the contract documents and the "instructions to bidders." To guarantee enforcement of a bid he prepares a standard form of "proposal" on which each contractor submits his bid and agrees to enter into a contract if the proposal is accepted within a stated number of days.

When bids have been received and accepted by you as owner, the architect draws the contract between you and the contractor. From that point until completion, he serves as impartial judge in the performance of the contract.

During the course of construction the architect keeps a set of books recording the financial transactions between you, the owner, and the contractor. At periods specified in the contract he accepts requisitions for payment from the contractor and checks these in detail to be certain that they cover only work which has been satisfactorily completed. Assured of the correctness of a contractor's request, the architect issues a "certificate of payment" authorizing you to pay the contractor a stipulated sum.

The architect's responsibility as business administrator does not end when he issues a certificate of payment. He must determine that the contractor in turn is meeting his financial obligations. As your agent he must make certain that materials have been paid for, that payrolls have been met, and that payments to subcontractors have been made.

It is the architect's responsibility to determine that work is done in accordance with the contract documents and to inform the contractor of unsatisfactory materials or workmanship. This requires periodic visits to the site and supervision of the work as it progresses. If and when disputes may arise between the owner and the contractor, the architect serves as impartial arbitrator in the interpretation of the contract documents.

In order to complete the contract, the owner must accept the building and arrange for final payment to the contractor. This payment usually is due thirty days after acceptance. Moreover, the architect must be certain that you do not unknowingly, by word or deed, legally accept the building before it is completed.

Formal acceptance must not take place until faulty work has been satisfactorily corrected, mechanical equipment has been tested and approved, and all details of the contract have been substantially completed. It is the architect's responsibility to certify when this point has been reached and its designation must be made without possibility of doubt; for after this point the owner becomes liable for anything that happens in, around, or to the building.

Since the interests of the owner depend so directly upon the ability of the architect, you must give careful consideration to his selection. If you are inclined to undertake construction without an architect, be sure that you can afford to gamble your savings without the guidance of professional skill. Few persons can afford to do so. Your elected representatives in government, charged with the responsibility of administering public funds, require by law that all public buildings, small or large, shall be built under the supervision of registered architects.

Wise selection of an architect must recognize the scope of work to be done. He should have experience in residential work and the technical knowledge to secure the best results without waste of space or money. To verify the quality of his work, you should visit homes he has built. An architect ought to be pleased to furnish the names of those he has served. His personality should be forceful enough to ensure proper performance of the contract. His reputation for honesty, integrity, and businesslike methods should be beyond question, and under no circumstances should he have a secondary interest that might prevent the exercise of impartial judgment in serving his client.

The standard fee of the American Institute of Architects for architectural service including supervision on residential work is 6 per cent. The standard fee for remodeling which always involves a greater amount of work is 10 per cent.

# THE CONTRACTOR

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**T**HERE are probably few businesses as hazardous as contracting and few where men approach their work with more enthusiasm. The great majority of contractors concerned with home building are skilled craftsmen who derive a sincere pleasure from doing work of good quality. Many even guard their reputations for good work at the expense of making additional profit. And this statement is made with full knowledge of the fact that many have suffered the scathing criticism of dissatisfied owners. Better understanding of the contractor's problem will contribute to the appreciation of his service.

The contractor who specializes in home building usually has a small force of skilled workmen who form the nucleus of his organization. In order to undertake work he has to invest a considerable sum in equipment which must be replaced from time to time. In addition to the normal overhead cost of operating a small office, he has the inevitable expense of bidding on many jobs that he does not get. He also must maintain a good credit rating.

The average owner who turns to a lending agency for money is usually unable to pay the contractor anything whatsoever until the building is under roof, at which time the lending agency advances a partial payment. Even then a prudent owner will withhold the 10 per cent considered as the contractor's fee. During this initial period of construction, the contractor pays for all labor and materials either from his own funds, from borrowed money, or by means of his own credit. It is important to recognize that the contractor is using his money or his credit to pay for your house until such time as you are able to repay him. This, of course, is business, and does not require an expression of gratitude, but it should encourage an owner to be considerate.

Throughout the period of construction the contractor may be the victim of hazards over which he has no control, all of which may affect the cost of the work.

If the contractor has agreed to build your house for a fixed sum, he runs the risk of increases in the cost of materials and labor during the life of the contract. The work may suffer damage or be delayed because of bad weather. A sufficient number of workmen may not be available, or workmen may leave for higher wages on another job. There may be delay in the delivery of materials or in the work of a subcontractor. If the power company is not prompt in furnishing electricity for a power saw, the expense of cutting framing lumber may be more than double. If he made an error in the estimate or in the bid, he must still complete the contract. In addition to all of this, a dissatisfied owner may cause him the legal expense of court action to settle a dispute.

In any operation as complex as building there are bound to be occasional misunderstandings and disputes, but in the great majority of cases they are the result of the owner's error, not the contractor's.

For the best interest of both you and the contractor, your relation should be one of clear understanding and cooperation while each scrupulously holds to his bargain. Neither should ask nor give more than has been agreed upon. Your relations with the contractor have a much better chance of success if you always remember that the contractor agreed to furnish what was shown on the drawings and described in the specifications, not what you thought was shown and described.

# WORKING DRAWINGS AND SPECIFICATIONS

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**B**EFORE a builder can undertake construction work or prepare an estimate of cost, he must clearly understand what is to be done. Both the owner and the builder must know precisely the shape and size of the house, the nature and quality of the materials to be used, and equipment to be furnished. Each must also understand the quality of workmanship required. This information forms the legal basis upon which their relationship is established.

If the information furnished to a builder is incomplete, inaccurate, or confusing he will probably follow either of two courses. He may protect himself by setting his estimate high enough to cover the maximum possible cost of each detail not clearly described. Or if he is unscrupulously bidding as low as possible, he may go to the other extreme of basing his estimate on the cheapest materials assembled in the cheapest way wherever an interpretation of instructions will permit.

In either case his decision does not favor you as owner. In the first instance you would probably pay much more than the value of work done. In the second case of cheap construction you may pay only for what you get, but may suffer high maintenance and repair costs for many years afterward.

Competitive bidding is possible, but meaningless unless information furnished to all bidders is the same, and as clear and complete as possible. When it is not, you have no basis on which to compare the bids and it is probable that they will vary considerably.

Some prospective homeowners have even been known to ask contractors for competitive bids on undimensioned plans and photographs torn from a magazine. This is not unlike buying the proverbial "gold brick."

If you expect full value for each dollar you invest, misunderstandings and disputes must be avoided. This can best be insured by furnishing the builder with a complete, clear, and accurate description of the building in the form of working drawings and specifications which have been executed in accordance with your requirements by a competent person.

**Working drawings**, as the name implies, are drawings which show the work to be done. They describe the physical outlines of the building with all of its walls, partitions, windows, and doors. They show the arrangement and connection of all materials. The outlines and locations of all equipment are indicated, together with complete information on sizes and dimensions.

A complete set of working drawings for the average residence would include (1) a plan of the plot showing the location of the building on the property, all existing and finished grades, the location of all utilities both in the adjacent street or within the property, the location of walks, driveways, lawn, and any



natural features such as trees, a stream, or rock; (2) separate plans of each floor and a plan of the roof; (3) front, side, and rear views indicating all heights, materials, and grade levels; (4) such details as may be necessary, but in any case a section showing construction of the exterior wall from the foundation to the roof; (5) schedules identifying and describing doors, windows, and interior finishes; (6) heating, plumbing, and electrical layouts showing the location and size of equipment.

You should understand the distinction between **drawings** and **blueprints**. Drawings are made with a pencil on thin translucent paper, then reproduced on blueprint paper by a process similar to the making of a photographic print. From one drawing any desired number of blueprints can be made. This permits the owner, the contractor, the architect, the lumber dealer, and the draftsmen all to have identical copies of the drawings while the valuable and fragile original drawings are filed in the office of the architect.

The **specifications** complete the working drawings by describing in words what the drawings cannot conveniently show. Generally, the specifications describe the quality or grade of each and every material as well as instructions about how it is to be installed in the building. They also give instructions governing such items as methods of fabrication, colors, finishes, and the catalogue designations of furnishings and equipment.

It is important to recognize that the specifications are not written for the information of the owner but rather to translate his wishes into technical instructions that are mandatory on the contractor.

You have only to read a well-written set of specifications to understand the technical skill and knowledge required to write them. The writer must have a broad knowledge of materials locally available and must be able to judge their suitability for a particular purpose. This requires an understanding of their physical characteristics as well as the various methods of installation. He must also have full information on comparative costs of materials together with knowledge of the factors affecting the labor cost of installing them. When you consider that an estimated ten thousand separate items go into the average house, the importance of carefully considered specifications is evident. The drawings establish the physical shape and size of a building, but the specifications establish its quality.

# CONTRACTS

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## VERBAL—WRITTEN—IMPLIED—CHARACTERISTICS OF A VALID CONTRACT

**W**HEN you build or buy a home you soon realize the complexity of a real estate transaction. The average transaction may involve real estate agent, buyer, seller, architect, contractor, banker, and lawyer. Many decisions will have to be made and agreements entered into which will govern the relationship between parties and their responsibilities to each other. Many of these agreements will form the basis of contracts.

Because the human memory is imperfect, time is important. You may easily remember your decision and agreements of yesterday, but even when both parties are honest and sincere, the passage of a month will cloud a verbal agreement and six months may wipe it completely from the memory of one of the parties. One party may even intentionally forget a verbal agreement made without witness—if forgetting means increasing his profit substantially. During the entire intricate process of building there ought to be complete understanding between you and those who do the work.

It is not uncommon for a person to undertake to build a house or to buy one with only a loose, easily misunderstood verbal agreement. Both parties can be scrupulously honest and in building the contractor may proceed with the work aggressively and with well-qualified craftsmanship. But in spite of these qualities, if misunderstandings about payments and compensation occur, they may lead to a court settlement. This is often the expensive conclusion of verbal agreements when they control a transaction as complex as building.

Those who have honest intentions can preclude the embarrassment of litigation and its consequent reflection on their reputations or their pocketbooks by recognizing at the very beginning the danger of incomplete understanding. Both parties will prefer a successful deal in which they can each take pride, and the difference between success and failure may hinge entirely on whether the agreement was written or verbal.

In every legal business transaction, whether it be as simple as buying daily food or as complex as assembling the thousands of individual items that go into a new home, the law presumes that you are capable of determining values and will not interfere with any agreement you choose to make. Furthermore, the law does not recognize whether you make a good or a poor agreement and will not excuse you from a poor one. Nor will the law insist when you build a home that your agreement be written; it may even recognize an implied agreement which you did not realize existed. For instance, the courts will recognize that you entered into an agreement with a contractor if you knowingly permitted him to enter your property and do work which increases its value even though no spoken or

written word passed between you and the contractor or any of his employees. Oftentimes a person not acquainted with the legal aspects of a business transaction may believe that it is best not to have a contract in order that he may arrange details as the work goes along. This attitude overlooks the fundamental fact that as soon as two parties reach a valid agreement, written, verbal, or implied, in the eyes of the law they have entered into a contract whether they meant to or not.

A contract is an agreement in which a party undertakes to do or not to do a particular thing for a stipulated consideration. When a contract concerns building or buying a house, it is binding not only on the individual who enters into it, but in the event of his death it is likewise binding on his estate and heirs. In any event, it is a commitment of money in exchange for property and if not made wisely can jeopardize the welfare and future of every member of the family.

Friendship, especially in smaller communities, often clouds the decisions of the person who under ordinary circumstances would exercise good business judgment. Unfortunately, friendship is not a substitute for a written agreement.

For example, you may have grown up with the contractor who is to build your new home. He may be your best and closest friend, as loyal and devoted as a man could be, and your feeling mutually sincere. As you discuss the building, neither of you wishes to discuss a contract, for to do so might imply a flaw in your friendship. Now suppose that after two months of construction work you go to the job one afternoon and say, "John, it's about time for me to pay you something," and you write out a check for three thousand dollars although you know it is somewhat more than has yet gone into the building. After all, John is honest and he accepts the check. But that evening John has a heart attack and dies! He is single and the estate passes to his brother living in a distant city. His brother is desperately in need of money. If this happened to you, many sleepless nights might be the consequence. You could lose a good lump of your hard-earned savings.

This story is not an exaggeration. It represents only one aspect of folly and is duplicated hundreds of times every day in different ways. Remember that friendship can not be weakened by clear-cut decisions and agreements, but it can be quickly and completely destroyed by misunderstanding, especially when the matter concerns money.

A contract is not something to be feared and avoided, but only an expression of services and methods of procedure about which both parties are in complete agreement. If the agreement has been reached after careful consideration and both parties do agree and understand each other, there is no danger whatsoever in committing the agreement to writing. However, when you try to put a verbal agreement in writing, you will invariably find that you do not quite agree and that some details have to be further clarified. These are the details that will cause trouble if ignored or loosely defined.

Ask your real estate broker or your banker whether they advise building without a written agreement. They each will be able to name people of your own community who have been hurt financially because they did not exercise good business judgment in reaching a clear and specific agreement with their contractor.

# CONTRACTS

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When a man enters into a written contract, it indicates that he has reached a clear-cut decision about what he will and will not do. It indicates that he knows and can describe what he will pay for and what he will not pay for, as well as how and when he will make payment. In other words, it indicates that he is willing to do business in a direct and straightforward manner. The person who does not desire a written contract or will not be party to one only casts suspicion on his own motives by his refusal to participate in a form of good business.

Every contract should be prepared with the idea that it may go to court, which means that it should be written by a competent person. The cost of legal advice is small compared to the risk which it will eliminate; do not try to be your own attorney. There is an adage which says that he who would be his own attorney has a fool for a client. A wealthy person who can afford to lose a few thousand dollars or pay for a lawsuit often can act unwisely without suffering serious financial consequences. But the average family that builds or buys a home needs the advice and protection of professional service. The few dollars of expense will be repaid many times by the elimination of risks which might have been unrecognized.

## CHARACTERISTICS OF A VALID CONTRACT

There are various types of contracts used in real estate and construction transactions, but all of them have five characteristics in common. These elements of a valid contract are (1) competent parties, (2) legal object, (3) sufficient consideration, (4) mutual consent, and (5) legal form.

**A competent party** in the eyes of the law is a person who is able to understand what he is about. Persons above legal age who are of right mind will usually be considered competent.

**Legal object** means that the contract must deal with what is lawful. In other words, a contract which requires an illegal act or which seeks to do what the law is trying to prevent is not enforceable. Moreover, a contract which cannot be performed without violating laws is not enforceable. You cannot, for example, contract with someone to drive a car through your neighbor's fence in order to destroy it. Nor could you contract with a plumber to install a cesspool if the local plumbing code specifically prohibited the construction of any private sewage disposal system. Both would be unlawful.

To be valid and enforceable a contract must be mutually binding on both parties and must be supported by a sufficient **consideration**. This means that it must involve the exchange of something of value; in other words, it is not enforceable unless one party agrees to accept something of value for doing what the other party wishes done. What you accept may be tangible, like money, or it may be something intangible like a promise to do a piece of work.

As an example of consideration, let us suppose that you do not like your neighbor's fence which separates your yards but is on his property. You might say, "I will pay you five dollars if you will paint your fence," and if he agrees, you have entered into a contract, the consideration being five dollars.

You might also say, "If you will paint your fence, I will not plant the high screening hedge I have ordered," and if your neighbor agrees, you have entered

into a contract. This time the consideration is not tangible, but is the intangible promise not to do what you have a right to do.

But suppose that one evening your neighbor says, "I know that you dislike looking at this fence and next week I'm going to have it painted." If your conversation ends at that point, there would be no contract, but only a promise which cannot be enforced because there was no consideration.

For **mutual consent** there must be a definite offer and a definite unqualified acceptance. There must be what is legally referred to as a "meeting of minds." This means that both parties must be talking about the same thing and must understand each other. If one party thinks he is buying one thing and the other party thinks he is selling another, there has been no meeting of the minds and consequently no contract. As an example, suppose a friend of yours owns a Ford and a Packard and customarily drives the latter. One day he offers to sell his car for \$500 and you agree to buy it. But when he delivers the automobile he brings you the Ford. You may complain that you didn't buy the Ford, and he may call your attention to the fact that he did not specifically offer the Packard. Neither party could enforce the agreement because, lacking a meeting of minds, no contract existed. They were not talking about the same thing when they reached an agreement.

**Legal form**, which means proper written form, is particularly important for all contracts involving real property interests. Its importance derives from the many details and decisions that should be recorded when real property changes ownership.

You will note that the first four characteristics affect the validity of the contract, but the last recommendation of legal form does not. This, however, should not detract from the importance of a written agreement.

# THE CONTRACT OF SALE

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**P**ROBABLY the most common type of building contract is what is called a **contract of sale**. This is the type of contract used in the purchase of a house which is already built.

The sale of real estate can be made without a preliminary contract simply by the seller's executing and delivering to the buyer a deed to the property and receiving the purchase price in exchange, but such transactions among good businessmen are infrequent.

The accepted businesslike procedure binds both parties by a written contract of sale before the actual transfer takes place some days or weeks later. This gives both parties time to arrange their affairs, search the title, check the insurance, move from the premises, arrange their finances, and to take care of such other matters as may be related to the change of ownership. The various terms usually considered necessary and proper in a contract of sale best explain the importance of this written agreement.

A contract of sale should contain:

1. The names of all parties, the date, and the town or city in which the agreement was made.
2. A statement that the owner agrees to sell and that the buyer agrees to buy.
3. An accurate description of the property.
4. The amount of the purchase price or other considerations together with the manner and time of payment.
5. A statement of all encumbrances, restrictions, or defects in the title. Some of these the buyer need not be concerned about since they will be in his interest. They may be, for instance, easements granted to the electric, water, or telephone companies, deed restrictions in a group development against keeping livestock or poultry on the property, or a restriction that only a single-family house, if any, can be built. The seller is not obligated to vouch for the truth of his statement, but it is the buyer's responsibility to check the accuracy of all statements made by the seller. Common law says, "Let the buyer beware!"
6. An agreement about possible loss or damage by fire. The courts in many states hold that the risk of any loss or damage between the time of making the contract of sale and the delivery of the deed falls on the buyer. This means that if the building burns down on the day following the signing of a contract of sale, the buyer not only loses his down payment, but must pay the full purchase price for the ruined building. You, the buyer, may protect yourself with insurance as your interests may appear, but do not assume that the owner's insurance automatically

becomes yours. Another method of protecting your investment would be to require a clause in the contract of sale to the effect that the seller agrees to deliver the premises in the same condition they are in at the time of executing the contract of sale, excepting usual wear and tear.

7. A clear-cut statement defining how buyer and seller are to share the cost of such items as taxes, water rent, and insurance premiums, all of which the seller may already have paid in full for the current year.
8. A section which clearly states what is and is not included in the sale, such as lighting fixtures, rugs, coal or oil on the premises, storm sash, screens, Venetian blinds, stove, and refrigerator. The courts will usually hold that the seller is obligated to include only those items that are fastened or attached and consequently a part of the building. For instance, this would cover the holders for Venetian blinds, but not the blinds themselves. You should not assume that the stove that you saw in the kitchen when you visited the house will still be there when you buy the house unless you specifically reach an agreement about it.
9. A stipulation about the form of the deed which the seller is to deliver. If you desire a warranty deed, the contract of sale must so specify. Otherwise you may be forced to accept one which transfers only the equity the seller has in the property.
10. The time and place of delivery of the deed. Although this clause is not necessary, it is desirable.

Probably no two building transactions are identical, since there are few identical buildings with identical owners. Consequently, the contract of sale will vary with each transaction. More provisions than those listed above may be added, or some may be eliminated, but since the court instructs the buyer to beware, competent legal advice is imperative for the protection of your investment.



# CONSTRUCTION CONTRACT

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AGREEMENT—GENERAL CONDITIONS—LUMP-SUM—COST-PLUS—SINGLE-CONTRACT SYSTEM—SYSTEM OF SEVERAL CONTRACTS—SYSTEM OF SEPARATE CONTRACTS

**T**HE person who enters into a construction contract must bear in mind that the essential objective of such a contract is the purchase of skilled services and a method of paying for them. This fact is often misunderstood by the layman who thinks of a construction contract as the purchase of the physical materials and equipment making up the house itself. Anyone can buy the materials for your house, but your contract buys the skill that will transform them into a building of good or poor quality. Unfortunately no combination of phrases or clauses in an agreement and no combination of lines and figures on your drawings can endow a contractor with skill and ability.

It is well to recognize that the greatest risk you assume when building or buying a house is poor quality of work. On this one factor you can lose money quickly, though your loss often does not become apparent until you sell the house. Only then do you realize that you may have committed an error in judgment.

Many home builders, in the belief that it is shrewd business, will award the contract on the basis of price alone, with no assurance whatsoever that the low bidder is capable of doing work of good quality or is even interested in doing a good job. If you insist on competitive bidding, the one precaution that will protect your interest is the careful selection of the contractors invited to submit bids. Select only those who are financially responsible and who can prove by example that they can do good work.

The architect, banker, or material dealer are all able by experience to advise you about the quality of work you may expect from a particular contractor. But you are the one who must finally select those to whom you entrust your money. If your selection is faulty, excessive extra cost and poor-quality work may result; but you can ensure against these by selecting your contractor or contractors wisely and with care.

A complete construction contract between an owner and a contractor should consist of four documents; namely, the working drawings, the specifications, the agreement, and the general conditions. When the contract is executed and its parts identified, the owner should place his signed copies in a safe place, preferably a safe-deposit box and have duplicate copies for everyday use.

The **working drawings** and **specifications** have already been described and each party should have identical sets of blueprints together with bound copies of the specifications. As a rule these are identified as contract documents by the signature of each party on the copy held by the other party.

## AGREEMENT

The **agreement** identifies the owner, the contractor, the architect, the scope of work to be done, and further stipulates the contract price, the method of payment, and the date of completion. It also identifies the drawings and specifications by description and stipulates that the general conditions are a part of the contract. The agreement is also signed by both parties.

## GENERAL CONDITIONS

The **general conditions** of the contract govern procedures in those construction problems which most commonly lead to court action.

In addition to the execution of drawings, specifications, and the supervision of construction, a large but often unrecognized measure of an architect's service is the protection of his client's financial interest in the work to be done. The experience architects have had protecting their clients has led the American Institute of Architects to publish standard documents which are available to the public at small cost through local book and stationery stores. These include various forms of agreements and also a standard form of the general conditions. It is advisable to use these only under the direction of a registered architect who will be fully acquainted with the interpretation of their meaning.

The following construction problems governed by the general conditions are those that bear most directly on home construction. Each job has its own characteristics and variable conditions may make other agreements advisable, but those which follow should be included under any circumstance.

All of these deal with what may happen during the life of the contract. Judgment and forethought would dictate that these agreements and understandings should be entered into at the very beginning, when to do so costs nothing.

The **contractor's responsibility to protect work and property** must be clearly defined. The contractor should agree to protect his own work and the owner's property from injury or loss and further agree to make good any damage, injury, or loss resulting from his negligence. Theft of materials is sometimes an annoying problem. If you have a lump-sum contract under which it is the contractor's obligation to turn over the completed work, under this contract he is in full control and loss by theft is his responsibility. If, however, you have a "cost-plus" contract under which the owner pays directly for the materials and consequently owns them from the time of purchase, the contractor can be held only for any loss due to negligence on his part or that of anyone directly employed by him. If he has taken all necessary and proper precautions against theft, you as owner must bear the loss. "Necessary and proper precaution" for house construction does not imply the employment of a night watchman unless the contract so specifies.

**Changes in the work requested by the owner** after construction has started can seldom be avoided. Under any contract you will wish to reserve the right to order extra work or make changes adding to or deducting from the work. You should make provision to adjust the contract sum accordingly in the lump-sum

# CONSTRUCTION CONTRACT

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contract. The cost-plus type of contract automatically takes care of changes by covering the total cost plus a fee.

When changes are made, they may cause an extension of time if a completion date has been specified. To order changes without adding an extension of time may make the completion-date portion of the contract unenforceable.

It is only good business to have all changes ordered in writing and, if possible, the cost agreed upon before authorizing the change.

It is customary for the architect to reserve the right to make minor changes not involving extra cost when these are to the owner's interest but either too trivial or too technical for the owner to bother with. In spite of relatively complete drawings and specifications, a multitude of these decisions about details must be made on the job.

**Claims for extra cost** caused by the owner's action must be handled in a manner agreed upon before construction is started. It should be understood that if the contractor claims that instructions, either by drawings or otherwise, involve extra cost not figured on in the lump-sum contract, he is to give a written notice of such extra cost before proceeding with the work. You should likewise authorize the work by written notice. In this way there can be no misunderstanding about what is to be done and what the extra cost will be. The only exception to this procedure should be emergency decisions to prevent endangering life or property.

**Deductions for uncorrected faulty work** can rightfully be made by the owner. In some cases it is not advisable to correct faulty work if, for instance, the fault is not serious and other good work may have to be destroyed to correct the fault. When a case of this type arises, the contract should provide that you may make an equitable deduction from the contract price for the uncorrected work. It is customary for the architect to assist the owner and contractor in reaching a decision that is fair to both.

**Delays and extensions of time** may result from a number of causes. It is usual for a construction contract to state that the contractor shall start work on or before a certain date and proceed without interruption until the work is complete. Unless time is mentioned in the contract, the contractor is only bound to do the work whenever he may choose—which, if he has many other jobs running at the same time, might not be for months. Sometimes, however, there are delays beyond the control of the contractor, such as rain preventing excavation, delay in the transportation of materials, or strikes. If a delay is serious, the contractor should make application for an extension of time, in writing, and the time of completion may be extended for a reasonable time if his claim is justified.

If you foresee that you may suffer damage or expense if you are unable to occupy the building on a certain date because the building is not complete, you should specify that "time is the essence of the contract," in which case you have the right to claim recovery for the damage or expense suffered.

**Correction of work after final payment** may be necessary. The agreement should provide that the final payment shall not relieve the contractor of the responsibility for faulty materials and workmanship, and that he shall remedy defects so caused or pay damages resulting from such defects which shall appear within one year of the date of substantial completion of the building. This clause may

be misunderstood, and your attention is called to the word "faulty." The agreement does not mean that the contractor is bound to correct all defects. Many may result from causes over which he had no control. Settlement of the building may have caused plaster cracks although the quality of materials and workmanship in the foundation was excellent. Materials expand and contract under changes of temperature and humidity. Cheaper grades of wood which may have been specified may shrink, warp, or twist. Any of these things may cause defects to appear through no fault of the contractor.

**The owner's right to do work** should be reserved and agreed upon. It is important for you to reserve the right to do work if the contractor should neglect to prosecute the work or fail to perform any part of the contract, and further to deduct the cost of such work from the contract sum. Unless this right is reserved, you are powerless to take work out of the hands of a negligent contractor. If you are insufficiently informed to recognize incompetence or failure on the part of a contractor, you must depend on your architect for this supervision.

When the owner undertakes to do any work himself or directly employs others at hourly wages to do work for him, he should have a clear understanding of his liabilities which are described in detail on page 145.

When the owner, on the advice of the architect, undertakes to do work himself, notice of this should be given to the contractor in writing and it is customary to allow him three days before assuming control of the work in question.

**The owner's right to terminate the contract** must not be overlooked. It is imperative that you reserve the right to terminate the contract after seven days' written notice:

1. If the contractor goes into bankruptcy.
2. If he repeatedly refuses to supply enough skilled workmen or proper materials.
3. If he persistently disregards laws, ordinances, or instructions.
4. If he fails to make prompt payments to subcontractors.

The agreement should make provision for you to take possession of all tools, equipment, and materials on the job in order that you may proceed with the work. If the contractor goes into bankruptcy, this may not be possible because the court may decide that the equipment of the contractor and materials not yet paid for by the owner become the property of the creditors.

**The contractor's right to terminate the contract** is a provision that reflects the owner's willingness to deal fairly and in accordance with good business practice. It is common to stipulate that the contractor may terminate the contract after seven days' written notice if the work is stopped by court order or public authority for a period of three months, through no fault of the contractor. Should this happen, the contractor may expect a reasonable profit on work done and he may suffer damages as a result of the stoppage.

**The right to withhold payments** will often help to control the work, but it should not be exercised carelessly. Payments should be withheld under the following conditions:

1. When defective work is not remedied.
2. When claims have been filed against the contractor by his creditors or when there is reasonable evidence indicating the probable filing of claims leading to bankruptcy.
3. For failure to pay subcontractors. This is the greatest single complaint on construction work. To prevent its happening to you, require the contractor to exhibit receipts showing payment to subcontractors.
4. When there is reasonable doubt that the work can be completed for the unpaid balance of a lump-sum contract. This may happen when the contractor tries to get out all his profit in the early stages, and is successful because of the owner's lack of knowledge or judgment and his desire to dispense with the services of an architect.
5. When damage has been done to the work of another contractor.

**Assignment of the contract** is seldom to the best interest of the owner. Both parties should insist that neither party have the right to assign the contract without the written consent of the other. Unless you do this, you may find yourself with an altogether different contractor from the one who was awarded the contract—and who had to assign it because he had too much other work to do. Naturally he would assign it at a profit to himself—a portion of your money.

**Release of liens** or a waiver of liens should be provided for in every agreement. A lien is a legal claim for compensation or payment resulting from the contribution of labor or materials. Every person who contributes labor or materials, whether he be the contractor or the day laborer who digs the ditches, has the right to a claim against the property if he has not received payment for his labor or materials.

In the case of a laborer or a materials dealer it is not enough to pay the general contractor, for if he in turn does not pay the others, each of those unpaid may file a lien against the property. This is done by recording the claim, usually at the county courthouse. The recording of a lien clouds the title to property and consequently makes it unmarketable. This might happen even though you have in good faith paid the general contractor in full for all labor and materials. In order to clear the title to your property, you would then have to pay the lien, which might mean paying twice for the same work or materials. Of course you could try later to collect from the general contractor.

In some states this problem can be met by requiring the contractor to sign a waiver of liens before construction starts. To be enforceable the waiver must be registered as statute may direct, usually at the county courthouse within ten days after signing the contract.

If a waiver of liens is required, the contractor should be so notified when he is invited to bid on the work. He in turn should notify all subcontractors and notice of the waiver of liens should be posted at the place of construction.

Where a waiver of liens is not permitted by law, the owner's interests are protected by requiring the contractor to deliver a complete release of liens or receipts in full for all labor and materials as a prerequisite to final payment for the work.

When an architect is employed, it is his responsibility to verify payments to

subcontractors, to laborers, and to materials dealers before approving any periodic payment to a contractor during the course of construction.

There are many types of building-construction contracts, but only two are common to residential work. Each has characteristics that are desirable and the choice of either type will depend upon the conditions of your personal problem. These two types common to house construction or remodeling are the lump-sum contract and the cost-plus contract. Their essential difference is in the method of paying for the work.

## LUMP-SUM

The **lump-sum contract** is based on the assumption that you can determine the cost of an article that is clearly described. For simple manufactured articles this may be possible and the cost figured accurately, but the nature of construction work is such that only an approximate value can be determined. It is impossible to describe a brick wall, either by drawings or specifications or both, in such a manner that every bricklayer could lay up the wall in exactly the same way at exactly the same rate of speed, using exactly the same quantity of materials. This example could be repeated hundreds of ways for the various elements of a small house. Consequently, although a number of contractors are apparently bidding on the same thing, their bids will, as a rule, vary considerably. Each bid is the result of an analysis of materials going into the building, the time involved in constructing it, the profit the contractor expects to make on the contract, and an amount to cover several contingencies such as available labor, insurance, and other risks which from his experience as a contractor he knows will be present during the term of the contract.

In this type of contract the contractor agrees to provide all labor and materials and to do all things necessary for the proper construction and completion of the work shown and described on the drawings and in the specifications, for a fixed sum of money which the owner agrees to pay him. This contract is most favored because the owner knows before starting construction what the cost of the building will be. This would seem to be ideal, but in many cases it proves to be otherwise. First, it presumes that the plans and specifications are complete in every detail and that few if any minor changes will have to be made. Secondly, it presumes that if any changes are to be made, the cost will be negligible. It is at this point that disagreements arise and trouble begins. It is also at this point that the owner needs the professional service of the architect to protect his interests.

Under the lump-sum contract, the contractor will exercise all of his skill and ability to do the required quality of work for the least amount of money. To do this, his interests are in conflict with those of the owner and the result may be disagreement and disputes. The architect here serves as the neutral arbitrator, though it is obvious that since he is employed by the owner he will tend to favor the owner's interests.

## COST-PLUS

The **cost-plus contract** is based on the acknowledgment that building construction requires a high degree of skill exercised by a person whose only interest



# CONSTRUCTION CONTRACT

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should be the owner's interest. In this type of contract the contractor agrees to furnish the materials and labor to complete the work, and the owner agrees to pay all the costs incurred by the contractor plus a percentage of these costs as the contractor's fee for services. It is customary under this contract for the owner to pay directly all costs of materials, supplies, and equipment. The contractor has nothing to gain by doing work of poor quality and is assured his profit regardless of conditions encountered on the job. Needless to say, he must be a man of integrity who will not permit costs to be "padded" by loafing workmen.

This type of contract is used by those who want to be certain of good-quality work and are willing to pay a little more for it. It is also common and advisable for remodeling or alteration work because, when the job to be done cannot be accurately described, a lump-sum bid would have to include a large sum to cover contingencies. If you cannot be sure what you will find until you rip the old plaster off, it is better to have a contract by which you agree to pay for exactly what you get.

It should be recognized in this type of contract that the owner usually pays for materials, supplies, and equipment directly; consequently the owner's credit, not the contractor's, may affect the price. The person who is not in business often believes that everyone pays the same price for identical articles, but such is not the case. The quotations of a radiator salesman may be very different to two prospective purchasers who have different credit ratings. Or the prices may be the same but the discounts different.

The type of contract you select does not govern the manner in which you may prefer **to let the work**. A single contract with a general contractor is probably the most common method in home building, but circumstances occasionally make it advisable to have several contracts or even separate contracts with each trade.

## SINGLE CONTRACT SYSTEM

**The single-contract system** is one in which all responsibility is on the shoulders of one contractor, called a general contractor, who in turn may sublet parts of the work to subcontractors. This makes contact with the work as simple as possible for the owner, since in all matters he deals with only one individual. If the contractor selected is honest, skillful, businesslike, and has a high credit rating, this system offers the most satisfactory arrangement. However, competitive bidding does not always lead to the selection of the best contractor. If the contractor does not do work of good quality, the single-contract system is far from ideal.

## SYSTEM OF SEVERAL CONTRACTS

**The system of several contracts** should be considered when it is inadvisable to trust everything to one contractor; there is sometimes an advantage in letting contracts such as those for mechanical equipment to separate contractors. This makes possible more careful selection of competent and skillful contractors for the more difficult branches of construction and ensures a higher standard of work. The disadvantage is the more complex supervision necessary for a group of



individual contracts and the consequent possibility of lack of correlation of the various trades. To prevent confusion, it is common practice to let several contracts but to charge the general contractor with supervision of all, paying him for this service.

## SYSTEM OF SEPARATE CONTRACTS

**The system of separate contracts** breaks all important branches of the work into separate contracts, substituting the management of an architect for the management of a general contractor. This is not included in the customary service of an architect, and since it increases his duties it is to be expected that his compensation should increase accordingly. By this system the owner knows the cost of each individual branch of the work, and if reduction in cost must be made, he can cut intelligently because all the estimates are available. The architect, however, must be a competent business administrator, for on his shoulders falls the responsibility of harmonizing and timing the work of all the separate contractors to see that materials are delivered to the job when needed, to settle the differences arising between contractors, and to keep accurate accounts of all transactions and payments.

There is one weakness in the system of separate contracts. If any item, article, or work is overlooked and not covered in any one of the separate contracts, the cost must be paid by the owner. In the complexity of describing what each contractor is required to do, it is easy to overlook an item or to have a description of what is to be done or furnished open to two possible interpretations. Whenever this occurs, responsibility rests with the owner. If poorly administered, this system can result in an unhappy experience. If well administered, it is excellent.

# CONSTRUCTION HAZARDS

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**T**HE owner's risks in any construction project are comparable to the risks of crossing town in his automobile. There are certain intersections and traffic hazards known to be dangerous. There are stop signs, traffic lights, railroad-crossing signals, as well as caution and speed-limit signs. These in themselves are not dangerous. A person may even decide to ignore all of them and successfully cross the city without accident. But, if because of doing it successfully once, he decides to ignore the signs entirely and forever, we can be sure that he will be party to an accident in a relatively short time.

Likewise, a person may ignore the "stop signs" on a construction project and come through without suffering damage. But it is the better part of wisdom not to try. Few of the hazards are dangerous if they are recognized and provided for beforehand, and few of them may happen on any one job. We hasten to emphasize this since a description of all construction risks under one chapter makes them appear so formidable that a person may be dissuaded from building. Remember, however, that each is a "stop sign," which, though in itself not dangerous, indicates a "dangerous intersection." A person who knows the location of all stop signs can, if he is cautious, travel the road without harm.

During the course of construction, differences of opinion or disputes about amounts to be paid often arise between the owner and the contractor. When an architect is employed, he will serve as arbitrator in reaching decisions agreeable to both parties. Disputes, however, often result in withholding or delaying payments. If the owner becomes overcautious, which usually happens in disputes, he may withhold payments in excess of the amount in dispute as a threat to the contractor. This is not good business. It may boomerang and imperil the effective execution of the whole job by affecting the contractor's credit.

Not many contractors who specialize in home building have unlimited money and credit, and many may quickly suffer loss of credit by not meeting bills when they are due. At this point you, as the owner, must recognize that the contractor is expecting to meet his accounts with the money you pay him. If through lack of business experience, carelessness, or oversight you fall behind in payments to your contractor, you are jeopardizing his credit. If he loses credit, he must pay more for materials. If he pays more for materials and has a fixed lump-sum agreement with you and furthermore does not wish to contribute his money to your home (and who can blame him?) he will be tempted to try to recover by reducing the quality of materials and workmanship. If a sum is to be withheld for work or materials about which there is a difference of opinion, the sum should approximate the value of the labor or materials under dispute.

It is not uncommon for an owner purposely to withhold payment to a contractor in order to force him to make concessions not included in the contract. Since the contractor values good will he is not in a position to "dun" the owner, nor is he usually willing to take the drastic action of terminating the contract

with probable legal expense. The owner may be inwardly pleased when the contractor, under duress, makes the desired concession, but you may be certain that the account will be balanced in some way, and not to the interest of the owner.

A contractor cannot afford to make concessions involving additional expense and hope to remain in business very long. As it is, his margin of profit is small in relation to the risks and hazards he may suffer. An owner is often led to forget that the contractor based his bid on exactly what was indicated on the drawings and specifications, not on what the owner *thought* was indicated on these contract documents. If the drawings and specifications are not done with professional skill, what the owner agreed to pay for and what he thinks he is getting may be two very different things.

Although changes in the work at the request of the owner may not appear as a risk, they should be considered with caution for two reasons. First, the cost of these extras may not be included in your budget and may consequently jeopardize your financial position. Secondly, unless you employ professional service, there is danger of paying much more for an extra than the work is worth. An unscrupulous contractor sometimes does not include in his bid a sum for profit, hoping thereby to be low bidder and accordingly to be awarded the contract. He will take this chance hoping to make his profit by overcharging on the extras. Any architect can tell you of instances in which a contractor hoped to collect as much as ten times the actual cost of the work done on an extra.

If there is any doubt about a contractor's reliability or his capacity to complete a job, he should be required to furnish a performance bond. This is not common in residential work, but nevertheless contractors are often unable to complete a job because of bankruptcy. If this happens and you do not have a performance bond, you may be certain that the final total cost of the house will be considerably greater than had been expected. When you take the time and trouble to investigate thoroughly the financial stability of a contractor, the need for a performance bond may be negligible.

Unless a contractor has a strong organization, his death may precipitate a condition wherein the owner's interests can best be protected by a performance bond. Death does not absolve the contractor's heirs or estate from completing the work, but lacking the knowledge or skill, the estate may be unable or unwilling to do so. The company granting the performance bond would then be obligated to complete the contract.

Unknown conditions must be considered a risk since they may be the cause of much expense. Every effort should be made to eliminate unknown conditions, but if this is not possible, it is wise for you to assume the risk yourself rather than pass it on to the contractor. As an example, suppose your site shows a small outcropping of rock. If you require the contractor to submit a complete lump-sum bid, in order to protect himself he must include enough to pay for excavating rock which may cost three or four times as much as common soil and clay. If, however, only 10 per cent of the excavation is rock, the contractor is ahead a few hundred dollars of your money because you forced him to gamble and he won. It would have been wiser to request that all estimates be based on excavation that can be done easily with a power shovel plus a per cubic yard price for rock

## CONSTRUCTION HAZARDS

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excavation in the event that rock is encountered. In this way you assume the risk and pay for exactly what you get. In any instance where there may be unreasonable variations from normal conditions, you should make provision to pay the contractor for the extra work involved. Following this rule, you will seldom pay more and usually will pay much less.

If a building adjacent to a site might suffer damage as a result of the construction work that the owner intends to do, the hazard can be reduced first by careful investigation, second by taking protective measures, and third by assuming the risk rather than requiring the contractor to include a premium in his bid to cover possible damage.

In any case, the owner who does the building should notify the owners of adjacent property by registered mail that he is going to build and will exercise the caution a prudent man would take to prevent damage to the other's land in its natural state or condition.

The rule familiarly known as the law of "lateral support," meaning support from the side, maintains that it is immaterial whether or not excavation is done with due care. If the excavation on one piece of property causes the neighbor's land to slide in, settle, or in any way change the original contour, he who digs is responsible therefor.

However, when the precaution of notifying the owner of adjacent property has been taken, it is then the duty of the neighboring property owner to take such measures as he deems necessary to protect his own buildings. At this point it is the usual custom for all parties concerned to enter into a contract with the general contractor for the protection of the interests of each individual connected with the operation.

The type of contract you select can insure you against inevitable changes in the prices of materials and labor during the progress of construction. The lump-sum contract plus a performance bond is full insurance against this variable. In a period of fluctuating prices, the bid of each contractor will include the cost of materials and labor, plus overhead, plus profit, plus a shrewd guess of the possible rise in prices during the life of the job. The latter may be a substantial figure, and if you are building at a time when costs and wages are being revised downward, a cost-plus contract may be in your favor.

The hazards of flood, lightning, fire, war, riot, earthquake, and tornado may all be covered by insurance policies easily available and relatively inexpensive.

The fire-insurance policy should be written as soon as inflammable material arrives on the job. It will start as a small policy and be increased in value at regular intervals in order to cover 100 per cent the cost of materials installed or stored at the job at all times. A representative of the insurance company, usually in consultation with the contractor or material supply company, estimates the value of the work as it progresses. Unless specifically stated, fire insurance does not cover the cost of tools owned by workmen, tools or equipment owned or rented by the contractor, or any construction shanties.

The risk of damage suffered by the public either as injuries, death, or property damage may be fully covered by liability insurance, but its importance is sufficient to warrant discussion under its own heading which follows.

# LIABILITY

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**T**HIS discussion of liability is but a brief expression of the opinion of architects who view the problem from the standpoint of a client's interests without pretense of speaking with legal authority. It is needless here to go into legal technicalities and the citation of legal cases. As an owner you want only a fundamental conception of your rights and obligations in order that you may protect yourself. Ultimately you will employ competent legal advice for your personal problems.

Under common law both workmen and the public have certain rights and both the owner and the contractor may be liable for injuries, loss of life, or property damage caused by their individual or joint construction activities. Each of them has certain duties and obligations to the public which they cannot escape.

Nearly all states have recognized the hazard suffered by labor on construction and other jobs and in consequence require all employers to provide workmen's compensation in the event of injury or loss of life. An employer commonly provides for this contingency by carrying what is called "workmen's compensation insurance." This insurance pays a workman a definite amount for a stated period if and when he can show injuries arising from and in the course of his employment.

The owner's contract with the contractor should provide that the contractor have in force such insurance as will fully protect him from claims under workmen's compensation acts. The owner, furthermore, should examine the contractor's policy to be sure that it is in force and that it covers the number of employees the contractor regularly carries on his payroll.

Although the contractor is liable for injury to his workmen, the owner's interests are involved for the reason that a contractor not adequately covered by insurance may suffer damages that cause bankruptcy. This would immediately jeopardize the investment of the owner.

If for any reason the owner exercises his right to do work or if he intends to do work not included in the contract, such as grading or seeding, he may become an employer and consequently also liable under the workmen's compensation act. When this situation arises, your interests may be protected in either of two ways. You may take out an insurance policy covering your liability. This would be advisable if you exercise your right to do work about which the contractor has been negligent. Or you may request the contractor to add the employees to his payroll. If this latter is done, and the employees are under the contractor's control, they are covered by his policy. For this accommodation it is fair to reimburse the contractor for the new employees' wages plus 10 per cent. This percentage is a fair service fee to the contractor.

In the latter case, if the sum involved is small, the agreement with the contractor may be verbal, but if the amount is considerable, you should have it in writing.

Both the contractor and the owner may suffer loss on account of injuries, loss of life, or damage suffered by the public. It is furthermore possible for either party, unless fully protected, to suffer a loss so great that he is unable to complete the contract. In that case he may even be sued for damages by the other party, thus doubling his troubles.

In some contracts the contractor agrees to assume all risks and hold the owner free from claims for damages. This does not relieve the owner from liability to a person who is injured. The injured person may bring action against the owner regardless of the agreement between owner and contractor. If you should suffer damage as a result of such action, you might have to bring suit against the contractor in order to collect. The law holds that the owner cannot escape his responsibility by delegating it to others. The attorney for the injured person may bring suit against either the contractor or the owner, basing his decision on which has the more money and is better able to settle a judgment.

As an example of what could happen, consider a possible incident. A house under construction invariably attracts uninvited but interested visitors, often on Sundays when no work is in progress. If a woman enters and, for some reason which may be attributed to negligence, trips, falls, and breaks her leg, the court will probably hold the contractor liable. The fact that the contractor may have posted a "No Trespassing" sign in a conspicuous place does not relieve him of responsibility. Moreover, it is extremely difficult in a construction job to prove that the contractor or one of his employees has not been negligent.

Now let us suppose that the contractor is a man of modest means, hardly wealthy enough to sue for damages, but you, the owner, have money. The fact that you are building indicates some assets of value. Could the woman sue you instead of the contractor? The answer is simply "Yes."

Toward the end of a job when the house is near completion it is not uncommon for the owner to move in before the workmen have finished and moved out. In doing this you would accept the keys and control of the premises, which represents taking possession. Although this may be a very informal action, it should be recognized that this action constitutes formal acceptance of the work. This is important to you because, by this action of acceptance, the contractor's liability ceases. From that time on, the owner, and only the owner, is liable for subsequent injuries caused by prosecution of the work to actual and final completion.

Both the owner and the contractor can and should protect their mutual interests by adequate liability insurance. Contractor's public liability insurance protects him against loss from liability or damages on account of injuries suffered by persons not employed by him, yet caused by his operations or the acts of his employees.

You can and should take out what is called **Owner's Contingent Liability insurance**. This policy indemnifies the owner for injuries suffered by persons not employed by him but caused by operation of the contractor or subcontractors. Since such owner's insurance protects only your own interests, it is advisable to select the company and the amount of coverage and pay for premiums directly. The cost of this protection is low.



## CONCLUSION

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**I**F homes were as uniform in character as the many standard articles of everyday use, it would be a simple matter to resolve the problem and guide a prospective buyer with a few well-chosen words. But home ownership is not a simple matter. Pieces of land are often very different in character. There is and will continue to be an infinite variety of homes, both in plan and in appearance. Moreover, homes may literally be built of hundreds of different materials put together in as many different ways. All in all, there is little uniformity and each problem must be analyzed in the light of its own particular characteristics.

The following summary has been added to facilitate a careful examination of your problem, in view of the variety of decisions that must be made. The summary consists of a series of brief statements, each of which is of sufficient fundamental importance to receive careful scrutiny before assuming the financial obligation of ownership.

Do not be over-optimistic about your capacity to pay. A heavy financial burden can take all the pleasure from home ownership. Examine conservatively and accurately your capacity to pay. Then face the facts.

A lending agency will appraise you as well as your property. One who is a good moral risk will have a reputation for straightforward, businesslike procedure.

Do not assume that all lending agencies charge the same rate of interest. Shop for a loan as you would for any other service.

The cost of house and lot represents only 90 per cent of the total development cost. Be certain that you provide for the additional 10 per cent in your building or buying budget.

It is good business to reserve savings equal to two months' salary for emergencies such as illness, accident, or unemployment. Do not put every penny available into your down payment.

All communities and neighborhoods are constantly changing, either for better or worse. One going downhill carries property values down with it.

Recognize the importance of schools, churches, parks, playgrounds, and transportation and their possible effect on resale value even though they may not seem important to you personally at the moment.

Do not neglect to inquire about restrictions and zoning. To build on unzoned property invites unnecessary risk.

Check all possible nuisances such as smoke, odors, noise, traffic, livestock, and poultry even though they may not be evident on your first visit. Wind and time of day affect the nuisance hazard of some of these.

Any necessary services which are not available may cause extra expense. Check water, gas, electricity, telephone, sewers, street lighting, street cleaning, snow removal, ash, garbage, and rubbish removal, mail delivery, fire protection, and police protection.



## CONCLUSION

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Examine the property for indications of surface or subsurface water. It may be bone-dry in summer and under water in the spring. Remember that water flows downhill via the path of least resistance—and that might lead into your basement.

Do not buy unless you are certain beyond doubt that the title to the property is clear.

Be sure that the house you build or buy is suited to your family requirements. Only you can decide whether the size of your family or other living needs are likely to change.

If you buy, do not be misled by gadgets. The pleasure you derive from home ownership will probably reflect the amount of work and walking you do to run the household smoothly. Gadgets are eye-catching, but unimportant.

Space, money, and quality are three variables. Fix any two and you automatically fix the third. You cannot buy unlimited space of high quality with limited money.

A "\$10,000 house" may vary in cost from \$7,500 to \$12,500, depending upon the quality of materials and workmanship. When you buy, it is important to remember that values are more than surface deep. Do not let kitchen gadgets or a tile bath distract your attention from hidden poor quality.

Do not ask a contractor to bid on anything except complete and accurate working drawings and specifications. If both are vague and incomplete, you force him to include a sum to cover the maximum cost of items which may be misinterpreted. This costs you more money.

If your knowledge of building is questionable, do not try to judge the completeness of drawings and specifications without employing professional advice. To omit only two words from a piping specification may mean the difference between early replacement and lifetime service.

Do not ask a contractor to make a lump-sum bid on a remodeling job unless all possible conditions are known. Any uncertainty makes the contractor gamble, and many times he wins.

Do not assume that all contractors are rogues, anxious to do as little as possible for your money. The great majority, as in every business, are straightforward and honest, seeking an opportunity to do work of good quality. Select them wisely.

Do not hesitate to employ a competent person to pass professional judgment on a house offered for sale. Rather be safe than sorry.

When examining a house for sale, do it thoroughly and with care. A quick decision may be expensive.

A written agreement is the only kind recognized as good business practice when the sum involved is large. Question the motives of anyone who seeks to avoid a written agreement.

Make up your mind to work with your contractor rather than against him. His interests and yours have much in common and harmonious cooperation is necessary for a successful transaction. This is possible while each holds scrupulously to his bargain.

Extreme care should be given to all payments for work and materials.

Examine your accounts and pay all bills promptly at the time agreed upon. The contractor is counting on your money to pay his bills for your materials and labor. To harm him financially is to endanger your own interests.

Remember the importance of a release or waiver of liens. It hurts to pay twice for the same job.

You cannot avoid construction risks and hazards, but you can reduce them by care and forethought.

Recognize your liability for injuries, loss of life, or damage to the property of others and protect both yourself and your contractor with adequate insurance.

Of course, in any analysis of home ownership, details are important; they cannot be ignored. These general reminders are intended merely to focus your attention on matters of chief concern.

This book has aimed at helping you to make a good investment—full satisfaction from your own home.



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